The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1704.—Vol. XXXVIII. LONDON, SATURDAY, APRIL 18, 1868. {STAMPED .. .SIXPENCE, {UNSTAMPED--FIVEPENCE

Original Correspondence.

THE PREVAILING LABOUR DISPUTES.

Sir,—I entirely concur in the view you express in the leading article appearing in last week's Journal, that the continuance of the collisions between employers and employed, of which we hear on all sides, must inevitably destroy the commercial supremacy hitherto enjoyed by the people of Great Britain. I am, therefore, the more glad to see your notice, in another article, of our attempt at Whitwood and Methley Collieries to work out, not only a cure, but a preventive, for those evils. I can now speak from ten years' personal experience of the constant, almost daily recurring, annoyance and pecuniary loss suffered under the ordinary antagonistic relations between capitalist and labourer, and from nearly three years' further experience of peace and prosperity induced by our attempt to give to each of our workmen a separate personal interest in increasing the prosperity of the undertaking. We have at Whitwood proved the system to be one which, pecuniarily, enriches him that gives and him that takes, whilst it equally tends to improve the moral character of the workmen, and to produce mutual harmony and goodwill among all members of the community. My special object in writing is to express the opinion that, although the system is especially calculated to produce good results in those trades which suffer most from the frequency and disastrous character of strikes and lock-outs, still that it is applicable, with more or less beneficial effects, to *all* undertakings wherein capital and labour are associated. The leading principles of the system, as applicable to any class of business, may be defined as follows:—

1.—That there shall be paid a rate of wages to the labourers, and of salary to the managers, not exceeding a reasonably low average of remuneration ordinarily given for similar work.

2.—That there shall be paid out of the first profits an initial or preference rate of interest upon invested capital, which rate shall also be a reasonably low average of the rate of interest and profit usually realised from similar undertakings.

3.—That if after such payment, and after a fair reservation has been made for restoration within a reasonable time of capital invested in dead works, or in depreciable stock, a balance of divisible profit remains, then such shall be divided as a bonus in the form of an equal percentage over the aggregate amount of capital invested and of wages or salaries earned during the period in which such profits have accrued. Thus the earnings of each workman or manager in respect of work performed during such period will represent the "labour capital," upon which he becomes entitled to receive his percentage of profits in excess of the initial rate of interest payable upon "invested capital." It will be observed that in this proposed mode of appropriation the labourer only receives the average rate current for similar work, unless he can, by increased efficiency and care in his work, stimulated by the hope of future reward, increase the profits of the capitalist over and above the average usually obtained from similar undertakings. The capitalist cannot, therefore, be a loser by the arrangement, and may be a gainer. The only possible objection that can be fairly urged is that although the labourer shares in extra profits he is not called upon to bear extra losses. To meet this I propose—

4.—That a certain proportion of any extra profits be set aside in two funds, one to be called "invested capital reserve fund," and the other "labour capital reserve fund," the amount to be apportioned between the two in the same relative proportions as if the sum had been actually divided between the representatives of capital and of labour, as provided for in clause 3; also, that in the event of the returns of any future year proving insufficient to pay the initial interest upon capital, such should be made up by an appropriation from the reserved profits of former years, each fund contributing towards such deficiency in the same proportion as it had participated in previous profits. I am convinced that the adoption of partnerships of industry must eventually do away with the interference of Trades Unions between employers and employed, because they grant everything that Trades Unions can legitimately demand. They will supersede the necessity for the proposed courts of conciliation, because, when established on a fair basis, and honestly carried out, they remove the cause from whence nine-tenths of the trade disputes, now so common, arise. Such, at least, was the hope and belief with which we first inaugurated the system at these collieries—a faith which time and experience has but strengthened and confirmed.

Whitwood Colliery, Normanton, April 14. H. Currer Briggs.

THE SHROPSHIRE COAL FIELD—No. II.

FORMATION AND DENUDATION OF STRATA.

Sir,—Evidences of denudation in the Shropshire coal field are not confined to the Great East Fault, although this is the most notable instance which occurs in connection with the coal measures themselves. At the very basement of this great storehouse of mineral fuel, both in South Staffordshire and North Shropshire, unmistakable evidence of erosive action presents itself, and at both these points the carboniferous formation lies unconformably upon rocks of the Silurian system. At Lincoln Hill, just at the margin of the Coalbrookdale coal field, the coal measures, if we include about a dozen feet only of intervening sandstone, rest immediately upon denuded rocks of Wenlock limestone, whilst to the north, near to the Wrekin, they rest upon carboniferous limestone, and south and south-west of the Severn upon those of the Old Red Sandstone and Ludlow limestone.

Here, then, are significant facts, sufficient at once to arrest the attention of the geologist. Two such series of rocks thus in juxtaposition, but so widely separated by time, indicate a gap in the consecutive history of the earth as great as if we were to blot out the intermediate history of this country from the close of the heptarchy to the reign of George III., only that the period of time in the latter case would bear no comparison with the former. If we suppose the Wenlock limestone to have been once covered at these points by the Ludlow limestone, and that again by the Old Red Sandstone, as is the case to the south, to say nothing of the carboniferous limestone and millstone grit, we are forced to the conclusion that thousands of vertical feet and hundreds of cubic miles of solid ground were here first piled up, and then cut down and carried away by the sea. Here, just above the caverns figured by Murchison in his "Siluria," are rocks now in contact, yet so distinct in character, that creation itself, in the interval of their formation, passed through many of its more striking phases; new species and generations came slowly into being, many of which, after running the cycle of ages, disappeared, and were again replaced by some others.

It may be that the Wenlock limestone rocks of this coal field never were covered to the same extent as in the south. For if we take into account the fact that in Southern Wales there is a regular gradation of rocks—that the whole series, from the lowest Silurian in Carmarthenshire and Pembrokeshire to the highest coal measures of Glamorganshire, are conformable and in regular order—also, that first the Ludlow, and then the Old Red Sandstone, come shelving and overlapping, the former diminishing to a complete wedge, which ultimately disappears in the "Passage Beds" on the right bank of the Severn, there appears reasonable grounds for supposing that there existed a shore sloping to the south, the result of high ground west, or north-west, on the margin of the Coalbrookdale coal field. It may be, too, that the elevations causing such slope was gradual; and, if so, it is easy to conceive that, in rising from a quiet deep sea inaction to a restless sea surface, relentless waves would cut away the newly formed solid matter, and the more so when aided by the rough artillery of hard quartz pebbles, such as now remain cemented together in sand as mementoes of the fray. If such elevation was gradual, it must finally have become too rapid for the erosive action of the waves, for we have evidences of the existence of land high and dry, or if not high and dry, sufficiently removed from the ravages of the sea as to allow portions of the carboniferous flora to find a slushy soil on which to flourish; hence, at the base of the coal measure formation, in a quarry half a mile from Lincoln Hill, four or five stout fossil trees were a short time since exposed, their roots spreading far and regular around, and dipping deep into the sandy soil.

But before passing to the coal formation at all, let us again glance at the great flooring upon which it rests in the two counties. If we go to South Staffordshire we find a state of things very similar. We have the same evidences of the denudation of the Silurian rocks, which have been frequently reached by shafts sunk through the coal measure, and which rise to the surface; the Ludlow from north to south, as from Sedgeley to Cradley, and the Wenlock on the east at Dudley, Walsall, and Hay Head. The dip of these Silurian beds is slightly to the west, just as in Shropshire the inclination is to the east, so that a slightly hollow basin, extending from Shropshire to South Staffordshire, was for a long time in course of preparation, prior to the deposition of the first coal seam. On the Shropshire side it was hedged in, as it were, by other sea beds. We have already alluded to the Old Red Sandstone wrapping round it on the south, and to the carboniferous limestone bordering it on the north. It is one of the peculiarities of the Coalbrookdale coal field that the Old Red Sandstone and carboniferous limestone sea beds approach each other, the former on the south, and the latter on the north, without meeting or occupying the same ground. This fact would appear to indicate elevated ground between these two points, or the removal of one of these old sea beds before the coal formation commenced, or both. The bed of the Old Red Sandstone sea is but a few inches, and at others but a few feet, thick along the borders of the coal basin, yet it is found rapidly developing itself in Herefordshire, where it attains a thickness of 3000 or 4000 feet, and surrounding the Forest of Dean coal field, girdling that of South Wales, comprising the Brecon and Carmarthen fans, and attaining a thickness of 9000 or 10,000 feet. Again, the carboniferous limestone, although but a very few feet in thickness where it approaches this coal field, is so far developed in Derbyshire as to form those elevated and picturesque hills which in Dovedale and other parts of the county give so much beauty and interest to the landscape; and, again, winding round the south-west coast of England, it is found to interpose between the coal beds and the Old Red Sandstone, attaining a thickness of 2000 feet. It is the third and older ocean bed, distinct in character and organic remains, on which the greater portion of the coal field immediately rests, as has been proved at a depth of 720 feet at the Meadow Pits, in the Madeley Wood field, as may be seen at Lincoln Hill and at Benthall Edge, where it rises in precipitous cliffs, and again at the bend of the road leading from Coalbrookdale to Wellington. At the latter place, and also at the Dunge, on the Bridgenorth road from Broseley, the upheaved bed of the Silurian sea, and the base of the coal strata immediately above it, may be seen within a few feet of each other, presenting features full of interest and instruction. In the former place we have vast piles of deep sea mud, accumulated and consolidated during long periods of repose and calm. In the latter we have evidences of a sudden change of elevation over a wide surface, then of depressions or subsidences, and, consequent upon such changes, by means of rivers, the varying depositions of the coal measures. If the great Silurian flooring of the coal measures extended uninterruptedly, and was favourably depressed for receiving the coal measures, and these measures can be correlated at the two extremites of the basin, there can be little doubt but that the Shropshire and South Staffordshire coal fields are but fragments torn off at either extremity of the basin, and whether the central portion yet lies intact beneath the intervening covering of New Red Sandstone, or whether it has been partially or entirely denuded, are questions just now of much import, and such as have yet to be solved.

John Randall, F.G.S.

COAL-CUTTING MACHINERY.

Sir,—Messrs. Rothery and Ridley have again entered the field in this department. It will be remembered that these gentlemen are the original inventors of the West Ardsley Coal-Cutting Machinery, which has caused such attention to that kind of work, and has done so much towards convincing our mining engineers that the task can be accomplished; and after seven years' close attention they have succeeded in arranging new machinery, better adapted, more economical, and in every way more efficacious than any that has yet come before the public. Of course time and practice have yet to prove this; but, coming from the hands of two practical men, there is little doubt on the point. In their present arrangement I understand they have done away with all the intermediate, intricate, and complicated parts, their new machine being as simple as can be expected; we, therefore, wish them every success, as it will be a great benefit both to the employers and the employed.—*Leeds, April* 16. Hard Coal.

OVER-WINDING IN SHAFTS.

Sir,—I notice in the Journal of April 4 that your correspondent, "G. R.," wishes to know the best invention that has been brought before the public for the prevention of over-winding in shafts. I believe that the best and most efficient, and, at the same time, the most simple arrangement for the prevention of those dire and heartrending calamities which take place from time to time by over-winding in collieries is Messrs. M'Gill and Walker's patent disconnecting eye-bolt. The numerous testimonials received by the inventor (Mr. M'Gill, of St. Helen's) from colliery viewers, managers, proprietors, and Government Inspectors of Mines, testifying to the excellent manner in which the patent eye-bolt acts, is a sufficient guarantee for its efficiency, and it cannot be brought too prominently before the mining public. Not a single pit or shaft in the kingdom ought to be without one. For the information of "G. R.," I beg to state that they are to be seen at work in numerous collieries in Lancashire and many other places in the North of England. D. P.

STEEL FROM PIG-IRON.

Sir,—In last week's Journal a notice appears of the discovery of a process whereby steel can be made direct from pig-iron. This discovery is attributed to Mr. J. P. Smith, C.E., Glasgow, who "commenced experiments *last* autumn." Without entering into the merits of Mr. Smith's process, permit me to say that steel has been (and still is) made direct from pig-iron at least three years *before* last autumn, in the Coatbridge district. This steel has been tested in every way conceivable, both in the engineer's shop, the roll-turner's, the cutler's, the saw-maker's, the file-cutter's, &c. It has also been tried for locomotive and wagon springs, and found to possess more strength and elasticity than any steel brought to compete against it. It also possesses the important quality of being as easily welded as malleable iron. For such of your readers as doubt my statement, my proof is ready when required. Robert Miller.

Coatbridge Tin-Plate Works, Coatbridge, April 15.

GOLD MINES OF VIRGINIA, U.S.

Sir,—At the time of the commencement of the revolution in the Southern States there were several gold mines on the eve of paying handsome dividends. Among them was one familiar to many readers of the Journal, it having figured conspicuously in its columns about the year 1851 to 1854, and belonging to a London company. It is known as the "Great Vaucluse Mine." A great deal of capital has been expended upon it, the mining operations and appointments having been carried out on an extensive scale. In 1861 it was seized, confiscated, and mostly destroyed by the Confederates. At the close of the war the owners had a survey and report made by the well-known firm of Richardson and Sons, mining engineers, of Pine-street, New York, and who subsequently undertook a contract for its entire reconstruction. This work has been going on for upwards of a year, and the mine is said to be now ready to return a steady yield of bullion weekly. It is worked entirely by Cornishmen. Some new discoveries of a very important nature have been made recently, and so abundant are the ores that I am informed enough has already been opened to keep 100 heads of stamps going, if they were provided, to reduce this quantity: at present their mill only carries 30 heads, but 75 more are to be attached as soon as the requirements of the works will admit of them. The floors are laid out on the most approved labour-saving principle, of which I am promised a full description in a short time after the mill has been in successful operation. The ores assay from $3 up to $40 per ton, the average of which is supposed to be about $12. By the terms of Messrs. Richardson's contract they are to efficiently work the mine, and to pay every cost, for $4 per ton, which, if the ores in working should only yield one-half the value of the assays, must become a very profitable adventure.

The Melville Mine adjoins the Great Vaucluse; it contains the same veins, but not so concentrated or so large as in the latter, yet very abundant. This is a New England company, under the name of the "Rapidanne Gold Mining Company." They have recently erected a set of patent atmospheric stamps, and another battery of ordinary stamps are in course of construction. Their mill is driven by water-power. The yield of their ores, thus far reduced, has rather exceeded $10 per ton: some specimens from this mine have realised $350, and one lot $700. Independent of the mining going on they have an engine pumping water from the river up to the top of the mills, and a system of washing or hydraulic mining is being done. The gold they obtain is of very fine quality, realising $19 per ounce, but whether there is sufficient to render the works remunerative has not yet been ascertained.

The Eagle Mine is on the Rappahannoc river, eight miles from the two above-named concerns. The ores from this mine are said to produce from $15 to $30 per ton. They have Ryason's patent high-pressure superheated steam amalgamator at work, which is said to extract every particle of gold; also some newly-invented crushers or grinders. I am not informed what is the result of this combination of experimental machinery and apparatus, but should not be surprised to hear that it has *crushed* the company.

The Mitchell Mine is ten miles from Vaucluse, in Orange county, and is one of a group belonging to the celebrated Whitehall range of mines. The superintendent here is adopting a prudent course: he is proving his ground before going to any very great outlay for the plant and machinery. It is considered by practical mining men that they will be successful in their operations.

Other mining properties are spoken of as about to be shortly set to work; among which is the extensive "Culpepper Mine," on the Rapidanne, which is affirmed to be one of the finest gold mines in the United States. At present the owners have not obtained sufficient capital to command an efficient working. It has a water-power of great magnitude. The lodes are very numerous, large, and rich. I am informed that application is soon to be made in London for the remainder of the necessary capital, and that Messrs. Richardson and Son have made an offer to work the mine at $3 per ton. I am promised a geological report of this property, which when published may interest some of your readers, but especially those who have lost money in Virginian mines. ——— Correspondent.

THE PROGRESS OF MINING—AS A SCIENCE, AND SOURCE OF COMMERCIAL WEALTH.

Sir,—Any person looking over the old mines of Cardiganshire 30 years ago, seeing that such great mines as Cwmystwith, Esgair Mwyn, Logylas, Bronfloyd, Cwm Erfin, and Goginan, with a number of others, had become entirely unproductive, would have hesitated to pronounce an opinion favourable to the country as a mining country; but that they would have been quite wrong in such an inference is now clearly proved. Nor was the mode of instilling vitality into this great mineral district either expensive or complicated; it was simply by following the most common mining rules and maxims—such as extend your levels on the course of the lodes, and what you can do by machinery do not do by hand labour. I will take some examples to elucidate my statements. We first commenced with Logylas, which in English means the "Blue Hills." This great mine was reduced to such poverty, that only one or two solitary tributers were working in it, and the returns of ore not 1 ton per month. There was an adit 60 fathoms deep, with a great forefield of untried ground between it and Hafod. At the council for working it more extensively it was determined not to drive the deep adit, but a level called the 44, about 16 fms. above it, eastward; and here, before stating the result, as we are discussing the progress of mining, and the best way to make it pay, let me state it is my opinion that if the old maxim of continuing levels on the lines of well-known productive lodes had been more frequently observed, the result of mining would be more often successful. In this case there was one of the finest and best crystallised lodes at the top or back in Cardiganshire, running whole for miles through the country, and is so standing at this moment, through the whole of the Hafod estate, with room for adits, with backs of from 50 to 60 fathoms. Yet all this ground, evidently full of riches, will probably lie untouched for generations. All this ground lies to the east of our adit, while to the western end lie in ruins a large range of workings, called Old or Western Logylas and I will state a curious fact about the ore raised from these old workings. In East Logylas, adjoining, the lead ore contains only 2 ozs. of silver to the ton, while in West Logylas, 200 to 300 fathoms nearer the trap rock outbreak of Ystraedmaerig, or, speaking more closely, Hendrefelin, the ore yields 10 ozs. of silver to the ton on the same lode. I mention this as I think it is good evidence that when lodes in clay-slates approach outbursts of crystalline rocks they generally improve in silver. That is one reason, but another is that it has been held by great authorities that there are no such crystalline outbursts in Cardiganshire. Well, whether that be so or not, the result of the continuation of the 44 fm. level eastward on the untried lode was that in a few fathoms it fell into a course of ore worth 50*l.* per fathom, which continued for 60 fathoms, and yielded at least 150,000*l.* worth of ore between the deep adit and surface. In such courses of ore as these, holding 4 tons of ore per fathom, which can be taken away for 60s., or 15s. per ton, it needs not very minute care in the management to produce profits. The difficulty in this department lies when lodes yield only a few hundredweights—say, ¼ ton—to the fathom. Under such circumstances it is not so easy to show profits, and shareholders are often unreasonably hard upon agents in this respect.

There was one thing that militated against successful mining in Logylas, that at first seemed irremediable; this was that the machinery for dressing was dependent upon mountain brooks and limited reservoirs for a supply of water; and in summer and winter the works had to be closed, and the returns suspended. Like most other difficulties in mining and other undertakings, when the matter was fully looked into a solution for them was found. It was discovered that some considerable lakes, called Llynfurdden, lay on the crests of the mountains between Cardiganshire and Radnorshire, the water from which was diverted at a cost of about 30*l.* per mile; and as the length was only seven or eight miles, about 250*l.* put an end to an obstruction that had hindered mining here throughout all time. It is said that some old Welsh poet had prophesied that the Bristol water—or rather that which flows to the Bristol side—should flow down to Aberystwith. I do not know that this is very important to the progress of mining, but if any bard had foretold the coming to pass of such an event, the fulfillment of the prediction seems too curious to be passed over without notice, albeit there may be a great many prophetic visions that do not find general realisation in this world. Logylas has continued a profitable mine during a period of fully 30 years, and I suppose is likely to go on so for many years to come. It is 13 miles south-east of Aberystwith. M. F.

THE DARIEN CANAL—No. XVII.

Sir,—The saving that would be effected by the adoption of this passage may be illustrated by the following comparison of the expenditure of time and money on the passage of a ship with a crew of 30 men from New York to California, *via* Cape Horn, with what it would be by way of the Canal:—

Via Cape Horn.—Time, 150 days; salaries and finding of officers and crew for five months, $5880; insurance on $90,000 (value of ship) for five months, $3600; wear, tear, and depreciation, at 10 per cent. per annum, for five months, $3750: total, $13,230.

Via Canal.—Time, 45 days; salaries and finding of officers and crew for 1½ month, $1764; insurance for 1½ month, $1080; wear, tear, &c., for 1½ month, $1125: total, $3969. Difference in favour of the Canal, 105 days, and $9261. From England to California the saving would be somewhat greater. Supposing the value of the cargo to be $100,000 the saving on it would be as follows:—

Via Cape Horn.—Interest at 7 per cent. per annum for 5 months, $2916; insurance at 4 per cent., $4000: total, $6916.

Via Canal.—Interest for 1½ month, $874; insurance at 2 per cent., $2000: total, $2874. Difference in favour of the Canal, $4042. The total gains of ship and cargo would, therefore, be $13,303, or about 6 per cent. on the value of both.

With respect to the cargo, it would avoid the damage to goods going round Cape Horn, which is at present a very heavy percentage on their value. Rear-Admiral Davis calculates, from the incomplete returns of 1857, that the saving to the trade of the United States, England, and France by the Canal route, if it had then been open, would have amounted, for that year, to $48,130,208, or 10,829,296*l.* 16s. He calculates the value of the ship and cargoes which would have passed through the Canal at $647,831,130, or 105,262,004*l.* 5s. The field for enterprise which will open itself, once there is a passage for the ships of all nations, through the narrow strip that divides the oceans, appears almost unlimited. The removal of this barrier would be the mightiest event in favour of the peaceful intercourse of nations which the physical circumstances of the globe present to the

enterprise of man, and would effect a complete revolution in the commercial relations of the world. Incalculable as would be its advantages in the present state of commerce, these benefits would be multiplied by the effect which such increased facilities of communication and exchange would exert to stimulate the immense masses of the human race thus acted upon to new efforts of industry in the development of the resources of the richest portion of the globe, and thereby to increase their wealth and material comfort, whilst in the eye of the philanthropist the moral influence upon all that section of the globe of a closer and more intimate communication with the civilisation and institutions of the more favoured countries of the North Atlantic will constitute a motive not inferior to the aggregate of all the material advantages enumerated above. The Emperor of the French has said—"A ship canal would raise immediately to a prodigious degree of prosperity those countries which such an enterprise would cause to be traversed every year by thousands of vessels, would open new marts for produce, and hasten by several centuries the march of Christianity and civilisation over half the globe." It is the great political, commercial, financial, scientific, moral, and religious problem of the age, which, when accomplished, will do more to christianise and civilise mankind than any other project. This cosmopolitan work, once completed, will endure for all ages, a monument of man's enterprise and ability, surpassing all others ever accomplished. In the words of the *Times*—"It is the grandest physical work the world can witness: the past has seen nothing like it, and any similar fame must be denied to the future, since there will be no more hemispheres to join." The *Sun* has said—"Ere long Darien will be the great inter-oceanic portal, the door of the seas, the entrepôt of the world, the storehouse of nations, the grand highway of commerce." And ones. All the commercial nations in the world will join in guaranteeing the neutrality not only of the territory through which it will pass, as has already been done by England and America in the Bulwer and Clayton Treaty of 1850, but also of the seas for 2000 miles or more from either terminus. The coasts will become common ground, where war shall not approach. This is the way towards securing universal peace. The Greeks had their games, so that they might meet on common ground once a year. The Isthmus of Darien will be common ground every day in every year, where all the nations of the earth will meet in peace.

As a mercantile investment, there is no doubt that this inter-oceanic navigation will be one of great pecuniary advantage. When we consider the fleets of ships of all nations that will desire to save the thousands of miles of distance which this Canal will enable them to do, the magnitude of the undertaking is met by certainty of the enormous profits which must result to the proprietors. No project has ever been before the public which embraces anything like the objects to be attained by the Canal. All other propositions have but local importance, and seek their profits from local trade; but this one is adapted to every ship afloat, and seeks a return from the trade of every country. Every maritime nation has an interest in its success, and as a railway makes its own traffic, so will this work most certainly greatly increase the commerce between the distantly separated countries which steam-power is only now beginning to reach. In such a case statistics are almost superfluous; it is safer to consult the history of the progress of commerce, and argue from it, than to calculate the profits from the existing state of things. But, even on this limited ground, it can be shown that the capital invested will meet with a good return by charging for tollage only a little more than the amount saved in the insurance, without reference to all the other advantages which the Canal will offer. The *Times*, of Oct. 15, 1850, says—"The traffic that would pass through the Canal, estimated now on the basis adopted in 1843, would amount to 1,700,000*l*. In the hands of the most timid this calculation could scarcely be reduced to any point that would leave the enterprise other than a legitimate and attractive one. But the great feature always to be borne in mind with regard to it is that it would be so identified with the progress of the world that its returns at any one period could never be taken to limit our ideas of what they would become hereafter. At the present moment, for instance, the calculations would be based on the existing tonnages of the various maritime powers and the present position of the channels of general commerce; but, when we consider that the shipping of the United States doubles itself every fifteen years, and that of England still increases rapidly, the prospect of the changes to be wrought by the undertaking will appear still further beyond the grasp of any of the common conceptions of past experience."—*Dublin, April* 14. E. CULLEN.

ST. JOHN DEL REY GOLD MINING COMPANY.

SIR,—Will you allow me to ask, through your valuable paper, the reason why the recent reports have not been circulated among the shareholders? I am induced to put this question because the reports of the working miners, who have just returned from Brazil, are of a disheartening character.

The following is an extract from a letter just received from a miner who worked for nearly 20 years in the mine, and, to use his own simile, "knows the mine as well as his own coat." He says:—"The water is up to 10 fms. above the debris, or 40 fms. from surface—where the workings were open 12 feet, they are covered with water for 150 ft. wide . . . ." "Cost, from 3000*l*. to 4000*l*. per month, as the next mail will show."

Should this be true, can it be doubted that the whole of the ground now suspended over the water will fall in? Therefore, under any circumstances, the hope of ever re-working this part of the mine must be abandoned.

Were it practicable to sink a new shaft to the depth of 300 fms., and put out a cross-cut to cut the vein, would not the weight of water upon a soft matrix, like the components of this large lode or vein, burst through, and result in equal disasters?

Apart, however, from the practicability of re-opening the mine, I have been informed that a letter was received in England about a month before the disaster, that the mine had fallen off, and the prospects of its future productiveness decreased. The produce of Gaia is of a poor character, as testified by the last returns, being only ·891 of gold per ton of stuff, or 7s., scarcely paying cartage and stamping. What do the directors intend to do? Would not, the more prudent course be to suspend every expensive work until duly advised by independent agents as to the best course to pursue as to the future? The invested assets, report says, will realise 25,000*l*. H. WADDINGTON.

SOUTH FRANCES AND WEST BASSET.

SIR,—I have this morning read the following paragraph in last week's Journal:—

"SOUTH FRANCES AND WEST BASSET.—At the last meeting of West Basset their legal adviser stated that two months had elapsed since the adjournment of the hearing before Mr. Baron Channel, for the parties to agree whether the arbitrator should be a mining captain, or a barrister, *without his having received any answer*. Mr. R. W. Childs, the legal representative in London of South Frances, *asserts* that if such a statement were made it is entirely contrary to the fact, and *contradicted by written letters in existence*. In this matter Mr. Childs has always felt the necessity of caution, and, therefore, took the precaution to make a note of what occurred before the Baron, which he read over at the time to prevent any possibility of misstatement. For the personal misstatements as respects himself Mr. Childs cares nothing, well knowing that Messrs. Smith, Roberts, and Paul, and the South Frances committee, have always been kept informed of what occurs from time to time in the litigation, and being well aware that everything that can be done has been done to bring it to a conclusion."

I beg leave to inform you that the communication I made to the West Basset Mine was by letter dated March 21, and as follows:—"Two months have since elapsed without his having informed me of *the answer* he has received, neither has he informed the Baron, although I believe he has asked him for a further appointment."

The statement in my letter was entirely correct, and has not been contradicted by any letters in existence, notwithstanding the assertion to the contrary by Mr. R. W. Childs. Furthermore, not any *answer* has yet been received by me or, as far as I know, by the learned Baron, although now nearly three months have elapsed since the hearing referred to. For a confirmation of what I have written, and a detail of what has passed, I would refer you to the letters from Mr. Childs, with other correspondence, published in the *West Briton* of the 2d and 9th inst.

Throgmorton-street, April 14. JOHN FINCH.

SUMMER HILL MINE.

SIR,—The following particulars of the present state and future prospects of this property, extracted from a special report by my own agent, will interest many of your readers:—The sett, which is held under lease from the Lords of Mold, is extensive, and is bounded and surrounded by mines that have been very productive and profitable, one of which yielded 9067 tons of lead, and returned profits amounting to more than 30,000*l*. The present operations are confined to exploring the ground at the 80 yard level, from which depth good returns have been made, but the pitches are now unproductive. The mine is dry, being drained by swallows, or natural fissures in the rock; the ground is easy for exploring, the ventilation good; and taking with these facts the highly mineralised state of the lodes, and the congenial matrix of which they consist, the mine may fairly be considered a fair speculation. CHARLES THOMAS.

3, *Great St. Helen's, E.C.*

HARDENING AND TEMPERING PICKS.—Assuming double refined cast-steel made expressly for the purpose to be employed, Mr. ISAAC B. HYMER, of Indiana, suggests the following as an excellent plan for forging and tempering picks. Be careful in drawing out the pick not to heat the steel higher than a cherry-red. Use an anvil and hammer with smooth faces. When finishing the pick do not strike it on the edge, but hammer the pick on the flat side, striking light and often, until the steel is quite dark, letting the blows fall so as to close the pores of the steel. If the last blows strike the edge of the steel, the pick will fly and "spawl" off. When a dozen picks are ready to temper, get two gallons of rain water, from which the chill should be taken, if in winter, by dipping a hot iron in it, add two pounds of salt, which dissolve, and your bath is complete. Heat your picks gradually from the centre, and let the heat run to the point, and when it is a dark cherry-red, dip the point of the pick vertically into the bath and hold it still, not moving it about to find a cool place. When the heat has left the part immersed, take it out and cool the balance of the pick in ordinary water used in the shop. This process should be repeated on the other end of the pick. When taken out of the tempering bath the pick will look silvery white. The use of the salt is to clean the scale from the steel and make it tough. With the edge made by this process the pick will cut clean, clear, and fine. The whole secret is in the heating and hammering. If not hammered enough the steel will spawl off, and if heated too hot it will crumble.

NON-LIABILITY TO INTEREST UPON CALLS.—Stocker's case, *in re* The Blakeley Ordnance Company (Limited), was heard by Lord Cairns, on appeal from the decision of the Master of the Rolls. By the Articles of Association of this company it was provided that if any member or shareholder failed to pay his calls, he should pay interest on them at 25 per cent. per annum; that on non-payment of calls the directors should be at liberty to declare the shares forfeited for the benefit of the company; and that such forfeiture should involve the extinction at the time of the forfeiture of all interest in and all claims and demands against the company in respect of the share, and all other rights incident to the share; but that the shareholder should, notwithstanding, be liable to all calls owing on such shares at the forfeiture. Lord Cairns held (affirming the decision of the Master of the Rolls) that, under the above articles, a member whose shares had been forfeited was not liable to pay interest upon the calls due from him when the forfeiture was declared.

Mr. F. B. Smart (Smart, Snell, and Co., accountants, Cheapside) has been appointed liquidator of the Westminster Mining Company (Limited).

Meetings of Scientific Societies.

LIQUID FUEL.

The consideration of the applicability, or otherwise, of liquid fuel as a substitute for coal in the generation of steam formed the subject of an elaborate and very able paper by Dr. B. H. PAUL, F.C.S., read before the Society of Arts on Wednesday evening. He observed that the economy of fuel is a subject of so much importance in a variety of aspects, and it affords so much scope for improvement, that any suggestion made with that object is always deserving of full consideration; and, even if such suggestion should be impracticable or erroneous, it is at least worth while to demonstrate clearly the circumstances which may be considered as justifying an adverse opinion. The proposal to substitute for the coal now used as fuel in steam-vessels some kind of liquid combustible, is an off-shoot of the excitement which has prevailed during the last few years in regard to the discovery of vast quantities of petroleum in America; and it was that material which was in the first instance recommended as the substitute for coal. A commission appointed in America to investigate the subject reported that petroleum was beyond doubt more than twice as effective as anthracite coal in the production of steam, and that steam could by the use of this material be produced in less than half the usual time. It was an inference by no means unnatural that if this were the case, and if coal could be superseded by this material as the fuel of steam-vessels, a very great portion of the space required in merchant steamers for the stowage of coal would be rendered available for more profitable cargo; that steam-packets might become independent of coal depôts at various points of their passage, and that vessels of war would be enabled to keep the sea for a very much longer time than they now do with coal. Any prospect of such advantages as these being attainable might reasonably have been expected to justify a more thorough and searching investigation of this subject than it has yet received in this country.

Besides petroleum, several other analogous materials have been proposed as substitutes for coal; for instance, the oil obtained by distilling some kinds of coal, or the shale which occurs in coal formations, and more recently the oil known as "dead oil," which is one of the products obtained in rectifying the coal tar of gasworks. All these materials resemble each other closely in being composed chiefly of carbon and hydrogen, which are, in various proportions, the combustible and heat-producing constituents of all kinds of fuel. For the application of these materials, and of liquid fuel generally, various methods have been proposed, but before speaking of them it is desirable to consider what is the evaporative power of those materials respectively, since that is a very important point to determine in regard to the question as to the relative merits of different kinds of fuel. The heat generated by combustion has been made the subject of the most careful investigation, and since the time of Lavoisier, La Place, and Rumford, the more precise measurement of the amounts of heat capable of being produced by the combustion of carbon and hydrogen has been repeated by several physicists, with results which agree so closely that they may safely be regarded as well established. The names of Dulong, Despretz, Andrews, Favre, and Silbermann are, moreover, an unquestionable guarantee that these results, and the methods by which they were obtained, are perfectly trustworthy. According to these results, the maximum heat-producing capabilities of carbon and hydrogen are in the ratio of 1 to 4·5—1 lb. of carbon generating 14,500 heat units, and 1 lb. of hydrogen 62,032 units. The heat unit here referred to is the quantity of heat which raises the temperature of 1 lb. of water 1° Fahr. (from 40° to 41°); therefore, the numbers given represent the quantity of water capable of being heated 1° Fahr. by the conversion of 1 lb. of carbon into carbonic acid gas, or of 1 lb. of hydrogen into water. As there are, in the Fahrenheit therometrical scale, 180° between the freezing point and boiling point of water, those numbers divided by 180 give the corresponding quantity of water capable of being heated from 32° to 212° Fahr. Again, the quantity of heat required to convert 1 lb. of water at 212° Fahr. into steam of the same temperature is nearly five and a-half (more exactly, 5·37) times as much as that requisite to heat 1 lb. of water from the freezing point to the boiling point. The quantities of water convertible into steam from the temperature of 212° Fahr. by the total heat generated in the combustion of 1 lb. of carbon (15·0 lbs.) or of hydrogen (64·2 lbs.) represent what is termed the "theoretical evaporative powers" of those substances. By the term theoretical, however, it is not to be understood that these values are in any degree imaginary or assumed; they represent actual facts, which have been established as the results of positive observation, and they are theoretical in reference to the practical application of fuel only in this sense, that these results are not realised in ordinary practice. The reason of this is not the existence of any uncertainty that the total quantities of heat generated by burning 1 lb. of carbon or 1 lb. of hydrogen are respectively capable of converting 15 lbs. and 64·2 lbs. of water at 212° Fahr. into steam, but it is simply the fact that under ordinary circumstances only a portion of the total heat generated in either case is ever available for the production of steam. The statement of the theoretical evaporative power of fuel, or of carbon and hydrogen as constituents of fuel, is therefore—like the statement of relative calorific power—only an expression of their relative capabilities, and it indicates in this respect a limit which, though it cannot be exceeded in any case, is never fully attained in practice.

After pointing out the very different number of heat units required to raise to the extent of 1° Fahrenheit an equal weight of various substances (carbonic, ·217; nitrogen, ·245; atmospheric air, ·238; steam, ·475; water, 1·000; and water at 212° Fahr., 966·100), Dr. Paul observes that it will be seen that water has by far the greatest capacity for heat both in the state of liquid and vapour, and that a very large quantity of heat is rendered latent in the conversion of water into steam. In burning carbon he shows that carbon requires 11·61 lbs. of air for every 1 lb. burnt, and hydrogen 34·78 lbs., but remarks that fuel is never burnt for raising steam in such a way that the supply of air is only just sufficient to furnish oxygen for the conversion of its carbon into carbonic acid gas, and of its hydrogen into water vapour. In order to maintain combustion it is necessary to remove the gaseous products from the furnace, as well as to supply fresh air continually; and when this is effected, as usual, by the draught of a chimney, the gaseous combustion products become mixed with the fresh air to some extent. Careful observation has shown that in ordinary boiler furnaces the quantity of air requisite for this purpose amounts to as much as that requisite for effecting the chemical change which takes place in combustion, so that the total supply of air to such a furnace requires to be at the rate of about 24 lbs. per 1 lb. of carbon burnt, and about 70 lbs. per 1 lb. of hydrogen burnt. The heated furnace gas, resulting from the combustion of the carbon or the hydrogen of fuel is the medium by which the heat generated is transferred to the water in the boiler; and if it could be managed that, between the moment of combustion and the time when the furnace gas resulting from it is discharged into the chimney, the whole of the available heat could be communicated to the water in the boiler, the evaporative effect realised might then be equal, or nearly equal, to the theoretical evaporative power of the fuel burnt. But this is never the case in ordinary practice. The extent to which the available heat could in any case become effective in producing steam by direct transmission to the boiler must, of course, be limited by the temperature corresponding to the pressure at which steam is to be raised. If that were 50 lbs. per square inch, the furnace gas could not be cooled down below 360° Fahr. before being discharged from the heating surface of the boiler into the chimney. The quantities of heat which would in such a case pass away in the furnace gas, without being directly effective in producing steam in the boiler, would amount to 12 per cent. in the combustion of carbon, and to 15 per cent. in the combustion of hydrogen. In the combustion of fuels under ordinary conditions there is always a great waste of heat. But though the total waste is considerably greater in the combustion of hydrogen than it is in the combustion of carbon, amounting in the one case to 32·6 per cent., and in the other to 24 per cent., of the total heat of combustion, the evaporative efficacy of hydrogen is nearly four times as great as that of carbon. This comparison does not take into account those sources of waste which are due to imperfect combustion, but applies only to such portions of the carbon and hydrogen of fuel as are actually burnt in the furnace.

In the combustion of hydrocarbons, whether solid, liquid, or gaseous, the total amount of heat generated will be determined by the relative proportions of the carbon and hydrogen they contain. Dr. Paul then shows that whilst the total waste of heat in the furnace gas from the combustion of 1 lb. of carbon is equivalent to 3·6 lbs. of steam, more than one-half of that heat is consumed in raising the temperature of the surplus air supplied for diluting the combustion product in the furnace. Consequently, any arrangement by which this surplus supply of air could be dispensed with, and combustion maintained at the same rate, would effect a reduction of the waste heat to the extent of 50 per cent., and an economy of the heat generated by the carbon of the fuel amounting to nearly 12 per cent. Herein consists the advantage gained by driving the air into a furnace, instead of drawing it in by means of a chimney; for in that case the supply of air may be reduced to just enough to support combustion, and at the same time the temperature of the furnace gas may be so far reduced, either within the flues or tubes of the boiler, or in a feed-water heater, as to render the greater part of the heat contained in it effective for production of steam. The possibility of economising in this way the heat generated by combustion of carbon is by no means unimportant; but it is of far greater importance as regards the heat generated by combustion of hydrogen, for in this case the total waste of heat arising from the discharge of the furnace gas at 600° Fah. above the temperature of the air supply is equivalent to about 12 lbs. of steam per lb. of hydrogen burnt, and nearly one-half of this is consumed in heating the surplus air supply. Therefore, by dispensing with this surplus air, and cooling the furnace gas in a feed-water heater, a saving of something like one-fourth of the total available heat might be effected. The combustion of the carbon and hydrogen of fuel presents another point of difference, which is important as regards the extent to which the available heat is, under ordinary conditions, capable of being rendered effective in producing steam. This difference is due to the presence of water vapour in the furnace gas, resulting from the combustion of hydrogen. As a consequence of this circumstance a large amount of heat is absorbed and rendered ineffective for producing steam. Every pound of water-vapour in the furnace gas corresponds to a waste of heat sufficient to produce rather more than 1¾ lb. of steam; and hence it will be evident how great is the disadvantage resulting from the presence of water in the furnace gas, whether originating from hydrogen burnt or from damp fuel, or otherwise.

Rather more than one-fourth of 1 lb. of hydrogen would give as much effective heat as 1 lb. of carbon with a somewhat smaller volume of combustion products. The extent to which this advantage affects the value or efficiency of fuel will, of course, depend on the amount of hydrogen it contains. Since no hydrocarbon available as fuel contains more than 15 per cent. of hydrogen, the actual evaporative efficacy of such a material, when used under the ordinary conditions, cannot at the utmost be more than about 40 per cent. greater than that of an equal weight of carbon. The amount of hydrogen in petroleum is probably larger than in any of the other hydrocarbons proposed to be used as fuel, and that contains on the average about 13 per cent. In coal and shale oil the amount of hydrogen is less. Consequently the evaporative efficacy of these materials, as compared with carbon, would not reach the above limit of 40 per cent. in excess. The ratio between these materials and ordinarily good coal is much about the same in regard to evaporative efficacy, since the hydrogen contained in coal compensates for the oxygen and ash it contains, unless the amount of these be very considerable. Dr. Paul demonstrates that 1 lb. of hydrocarbon, containing 14 per cent. of hydrogen, yields about 31 lbs. of furnace gas, and the relative evaporative efficacy (carbon or coal being=1) is 1·39; whilst 1 lb. of carbon, containing 25 per cent. of hydrogen, yields about 36 lbs. of furnace gas, and has the relative evaporative efficacy (carbon or coal=1) of 1·69. He is not aware of any liquid hydrocarbon applicable as fuel which contains so much as 25 per cent. of hydrogen, so that an evaporative effect of about 16 lbs. of steam per 1 lb. of hydrocarbon burnt must be regarded as the maximum result to be attained with such material used as fuel. By burning these hydrocarbons with only just enough air for combustion, or half the quantities assumed to be supplied in these estimations, the effect capable of being realised would be from 13 to 14 per cent. greater than in the case stated above, or about 18 lbs of steam per 1 lb. of hydrocarbon, containing 14 to 15 per cent. of hydrogen.

The plan of using liquid fuel which seems to have proved most advantageous is that of Messrs. Field and Aydon, which to some extent, at least, secures the advantage to be gained by forcing air into the furnace. According to this plan the oil is supplied to the furnace through a small pipe, together with a jet of high-pressure steam, by which it is converted into spray, much in the same manner as, in the toy known as the perfume vaporiser, a liquid is blown out of a bottle by a current of air. The steam-jet at the same time induces a current of air, which mixes with the oil spray, and supports its combustion. The oil he saw burnt in this way was the dead oil, a refuse product in the refining of gas tar. Unfortunately, the quantity of this oil which is available is very small as compared with the requirements of steam navigation, probably not amounting to 100,000 tons a year in the whole country, and, therefore, its application must be very limited. In order now to arrive at some estimate of the advantage to be gained in a steam-vessel, either in point of weight to be carried, or space occupied by liquid fuel as compared with coal, it is evident that 100 tons of petroleum, or coal oil, would do the work of about 140 tons of good coal. But as coal is rarely burnt in such a way as to be rendered useful to its full capability, and as there is always a considerable waste in the shape of dust and cinders, which would not be the case with liquid fuel, a further allowance must be made for this. Assuming that one-fifth of the coal is wasted in this way, than the equivalent of 100 tons of oil would be 175 tons of coal, for taking the density of the oil as ·850, it would occupy about the same space as an equal weight of coals, or at the rate of about 53 lbs. per cubic foot. This difference would enable a vessel capable of carrying coal for 12 days steaming to carry oil for 21 days. In burning this oil there would be a saving of labour in stoking, and as it would not give any ashes, a great deal of trouble would be saved in that way.

The highest evaporative effect obtained with petroleum in the experiments under the superintendence of Mr. Trickett, the engineer-in-chief, at Woolwich, was 11·63 pounds of water converted into steam per pound of oil burnt. In this case, however, the combustion was imperfect. But in the most successful trials with coal oil and shale oil, when very little smoke was given off, the evaporative effect was about 18 lbs. of steam produced per lb. of coal burnt. In this case some deduction required to be made for the steam applied as a blast to the fire, but the amount was not ascertained. This result was also obtained under peculiarly favourable circumstances as regards the proportion of heating surface of the boiler to the rate of evaporation. Dr. Paul remarks that he imagines it is now generally acknowledged that this material in its natural state is not well adapted for the purpose. In that state it contains a large amount of very volatile hydo-carbon, which, even at the ordinary temperature, vaporises by contact with air, and the mixture of this vapour with air is explosive. At the temperature of a steam-vessel's stoke-hole this vaporisation would take place more readily, and if there were any leakage in the supply pipes or tanks disastrous consequences might ensue. In order to remove this objection to the use of petroleum as liquid fuel, the more volatile portion of it must be separated from it by distillation, and that operation, when carried far enough to render the oil fit for use with safety, would reduce the quantity to about one-third. Another objection to petroleum in its natural state is its bulkiness, the gallon weighing only about 8 lbs.; this is, to some extent, removed by the distillation, and by the reduction of the quantity to one-third an oil is obtained which weighs about 8½ lbs. per gallon.

The relative cost of coal and oil is to some extent still an open question, but Mr. Paul shows that, taking the favourable estimates for oil given in his paper, the cost of oil would be about three times as much as that of coal. That there may be circumstances under which the advantages to be gained by the use of oil as fuel would altogether outweigh any considerations as to this or even a greater rate of cost, it does not require any great penetration to perceive, but it appears to him, as it must to all who really consider the question, equally evident that if those advantages are to be attained only at such a cost the use of oil as fuel for steam-vessels must in any case be restricted to exceptional cases, in which cost is comparatively a matter of secondary importance, and that it cannot be regarded as likely either to revolutionise steam navigation in general, or to call for a total reconstruction of our navy. In conclusion, Dr. Paul expresses the opinion that the mode in which this subject has hitherto been dealt with illustrates, in a striking manner, the want which is somewhat vaguely felt of what is termed "technical education," by which he understands a means not merely of making those whose business is of a practical character better acquainted with the principles of science and the laws of nature than is generally the case in this country, but also of educating the cultivators of science in a knowledge of the requirements of art, and of the conditions under which science can be made serviceable to practice. If such a closer alliance between science and practice were achieved, he believes it would be found of mutual advantage, and then he apprehends we should soon cease to hear anything more of than fancied antagonism between the two which is the most effectual barrier to progress, and deserves only to be regarded as an indication of ignorance or bigotry.

DETECTION OF DELETERIOUS GAS IN COAL MINES, &c.

Dr. PALEY, of Ripon and Halifax, delivered an able and interesting lecture before the members of the Halifax Literary and Philosophical Society, on the "Detection of Deleterious Gas in Coal Mines," &c., illustrated by numerous chemical experiments and diagrams. The lecturer commenced his address by noticing the origin of coal, with regard to which he said nearly all geologists were agreed.—1. That it was exclusively of vegetable origin, having probably been formed from the destruction of immense forests.—2. That similar formations are not improbably going on at the present time in certain parts of the sea, since it is well known that prodigious quantities of timber are being continually drifted by some of the great rivers of the world into the ocean.—3. That the climates of those parts of Europe, judging from the nature of the preserved vegetables, was not merely tropical, but ultra-tropical. It might also be inferred that those strata were deposited in the neighbourhood, and probably upon the verge of extensive tracts of dry land; for the trees that were found in coal strata are often like those of our submarine forests, or of the Portland dirt-bed, so far as position goes; and, finally, the deposits of coal appear afterwards to have been elevated, and often singularly dislocated and controlled, by forces acting from below, and probably of a volcanic nature. That those deposits have taken place, and that the change of wood into coal has often been effected under great pressure, and often under pressure and heat combined, seemed evident from the appearance of some of the vegetable masses, and also from the manner in which the carburetted hydrogen escapes in the form of "blowers" and eructations from the strata, as if pent up in their cavities under vast condensation, and even sometimes perhaps in a liquid form. Mr. T. J. Naylor, one of the most experienced of their colliery viewers, stated that the mean annual quantity of gas evolved from a barred-up district of 50 acres in the Bentham seam at Wallsend Colliery was 34½ millions of cubic feet, equal to the solid contents of a coal bed 5 ft. thick and 160 acres in extent. Respecting the origin of coal, the opinion first advocated by De Luc, and more recently by Adolphe Brongniart (the celebrated fossil botanist), was that coal beds have been extensive sheets of vegetable matter, resembling in that particular peat-bogs, which have, one after the other, been submerged and covered by sand and silt. There were numerous facts in favour of that view, which had also the sanction of Mr. De la Beche, as being, upon the whole, more consistent with the phenomena presented by coal formations. With regard to the twisted, dislocated, upturned, and broken strata, so common in all coal districts, and which has sometimes been regarded as a bar to the miner in extracting the coal, the lecturer remarked, in the words of one of their ablest geologists, that on looking at the matter more closely it would be found those very irregularities and inconveniences were, in fact, highly advantageous, for they often heaved up seams of coal that would otherwise have been beyond reach. They also performed the more important service of excluding the passage of subterranean waters from one part of the workings to another, so that the miners in collieries situated in one particular mass have only to contend with the waters in it: whereas if the strata were always unbroken and continuous, such would be the abundance of water flowing into the workings that the greatest difficulty and expense would be incurred in proceeding, and it would often be necessary to abandon the further extraction of the coal.

The lecturer then proceeded to notice the mode of extracting the coal by the pillar and stall and the long wall systems, and thence to the liberation of the gas in coal mines. He said coal beds varied very much in respect to their gaseous accumulations. There were some districts in which "fire-damp" was unknown, and beds which contained much carburetted hydrogen in some parts, whilst other parts were entirely free from that gas. It was not easy to account for that difference. In all probability the age of the coal, the conditions under which it was formed, and the length of time during which the masses of coal were exposed to atmospheric conditions before they were buried under the strata of sand and shale which now covered them, determined the physical conditions of the bed. On one occasion, at Seaton Delaval, 4900 feet of gas were evolved in three minutes; and at Hebburn Colliery, where the process was continuous, about 4500 cubic feet of explosive mixture was formed in two hours. To the various methods adopted for the purpose of removing those dangerous gases as quickly as they were formed the lecturer briefly referred, and said it was quite possible to ventilate the whole of a mine in such a way as to preclude the possibility of an accumulation occurring in any portion of it; but inasmuch as in the present state of the law ventilation was only required to be carried into those portions of the mine which were in active operation, thus permitting accumulations of gas to take place in the goafs and wastes, explosions must from time to time occur, as those old workings became reservoirs of explosive material, which in the ordinary working of the mine were liable to be tapped by the miner, thus causing a sudden swamping of the whole mine with an atmosphere which only required a naked light to explode. Even a rapid diminution of atmospheric pressure would cause the same overflow, thus quickly rendering portions of a mine which had previously been considered safe even when worked by naked lights highly dangerous and explosive. The remedy for such a state of things would seem to be the passing of an enactment by which the existence of a larger amount than 5 per cent. of fire-damp in any part of a mine should render the owner liable to severe penalties. He placed the amount at 5 per cent., as 7½ per cent. formed an explosive mixture, hence the former was the maximum that ought to be allowed. He had before him an instrument by which the presence of a much smaller quantity was easily rendered evident, and which, in the hands of the viewer, would at once do away with any presumed difficulty there might be supposed to exist in ascertaining readily the actual state of the mine.

With regard to the various systems of ventilation, what was called "natural ventilation" was formed on the fact that as they descended into the earth by means of a shaft the temperature increased, and in some ratio to the depth. Mr. E. Hull gave 1° Fahr. for every 83·2 ft.; Prof. Phillips obtained results which appeared to show 1° Fahr. for every 60 ft.; and Mr. R. W. Fox gave, in the deep mines of Cornwall, for the first 100 fms. 1° Fahr. for every 50 ft., in the second hundred 1° Fahr. for every 60 ft., and for the third hundred 1° Fahr. for every 75 ft., thus showing that the increase was in a constantly diminishing ratio. It, therefore, followed that the air after it passed through a mine is of a higher temperature than when it entered, thus becoming rarified and passing into the "upcast" shaft, presenting a volume of air specifically lighter than that in the "downcast." In that manner a continual current of air was produced down one shaft, which travelled around the workings, and up another shaft. The next method was that of furnace ventilation, where the air being heated on one side of the shaft, the ventilating current was produced by the difference of density of the air passing down one side of the shaft, and that passing

up the other side—the velocity of the current varying with the square root of the difference of temperature between the two columns of air. Another method was that known as the steam-jet ventilation—a jet of steam issuing under pressure at a high velocity, as applied at Seaton Delaval by Sir G. Gurney with success. Of mechanical ventilation there were two kinds—the first, by machines exhausting the air by direct expansion and compression in a cylinder or chest, and the other by producing a vacuum by centrifugal action. The latter including the various kinds of fans, whilst the former is represented by the piston and cylinder machines.

Now, with regard to fire-damp, and the means employed for its detection, it may be stated that the gas is light, and, therefore, rises to the upper part of a gallery in a mine, and remains in that position, unless in exceptional cases. It is inflammable, burning with a luminous flame, and in its combustion forming water and carbonic acid—the latter being the "choke damp" of the miner. A mixture of fire-damp and air containing 6 per cent. of the gas burns quietly. If the quantity be increased to 7½ per cent., the mixture explodes; but the most destructive proportion is 10½ per cent. of fire-damp to 89½ per cent. of air. Fire-damp requires a high temperature to ignite it, and by its combustion produces a still higher one, consequently it singes off the hair, burns the skin, sets fire to garments, and even to coal, so that they frequently heard of mines being on fire after explosions. The gas had a peculiar odour, which varied considerably. In some mines it has a faint smell of alcohol, in others of tar, and again in others it has a foetid smell not unlike fennel. It occurred naturally as a result of the decomposition of vegetable matter contained in the mud of stagnant water, such as rivers, marshes, &c., hence its name, "marsh gas."

Until the beginning of the present century the only means of ascertaining the accumulation of fire-damp to a dangerous extent was at the almost certain risk of igniting the whole, whilst the dim light afforded by the "steel mill" was the only one with which a dangerous atmosphere could be approached, and even with that there was the actual danger of the sparks given off inflaming the gas. In 1812 the explosion at Felling Colliery, which caused the loss of three-fourths of the large staff of workmen, led several persons to make the most earnest endeavours to devise some remedy for the evil. The first recorded invention in that direction was the lamp invented by Dr. Clanny, said to be capable of being burnt in an explosive atmosphere. Sir Humphry Davy then turned his attention to the subject, and adapted his lamp so that the miner could carry on his work without allowing the flame to come in contact with the surrounding atmosphere. The disadvantages, however, attending the use of the safety-lamp are—1. Under certain circumstances the fire-damp will explode through the gauze of a perfectly constructed lamp.—2. The lamp goes out if taken into a very impure atmosphere, which happens in cases where light is absolutely necessary to the saving of life.—3. The Davy lamp may be, and often is, opened by the miner, even after it has been locked by the lamp keeper.—4. It may easily be extinguished by a current of air, or by a drop of water falling from the roof.—5. If the lamp be tilted on one side the oil is liable to run over the gauze, and not unfrequently causes an explosion. Despite many disadvantages, the Davy lamp has proved of great value in detecting fire-damp in pits, and in giving sufficient light for the miner to work in an atmosphere containing a considerable amount of explosive gas. Many changes and alterations have been proposed from time to time for overcoming some of the objections named, but hitherto without success; it may, therefore, be concluded that all merely mechanical contrivances for shutting off the gas from the source of illumination have proved failures, so that science must look in another direction for the means of lessening the danger attendant upon mining.

Mr. Ansell, of the Royal Mint, lately invented a most delicately-constructed "Indicator," whereby a person was enabled to detect the smallest appreciable quantity of fire-damp in a mine by the practical application of a natural law, that of "diffusion." With regard to the laws which govern the diffusion of gases, it might be stated that when two different gases, as fire-damp and atmospheric air, were brought into contact with each other, they had a tendency to mix, and whilst the mixing was taking place the atoms of each gas travelled at a certain speed peculiar to that gas, which speed remained the same under all circumstances, being inversely proportionate to the square root of the density of such gas. Another peculiarity was that the speed of a gas remained the same whether it was passing into space or intermixing with another gas, and whether it was passing through a porous substance or through an open tube. Mr. Ansell practically applied those facts to the detection of fire-damp, and since his indicator enabled him to ascertain the exact percentage of the deleterious gases, the application was of the very highest importance and value, not only for coal and metal mines, but wherever subterranean works were going on, for it readily indicated the pressure of the deadly choke-damp when in any poisonous amount. Accumulations of gases unfitted for the support of animal and vegetable life were, by the law of diffusion, silently and speedily dispersed. Even respiration itself could not long be maintained were it not for the process of diffusion, which rapidly displaced that which had been rendered unfit for the support of life, and at the same time drew downwards and into the lungs a fresh supply of purer, better, and specifically lighter air. Fire-damp diffused readily through air, and on that was founded Mr. Ansell's method for detecting its presence. It had been represented to Mr. Ansell that fire-damp would become comparatively harmless if its presence in a mine could be made known by a signal in the manager's office above ground, the essential conditions being that such means should be entirely self-acting. In 1862 Mr. Ansell visited some coal mines, and was conducted to a portion of a pit known to be highly charged with an explosive mixture. The gas caused a peculiarly helpless feeling, and "his head had an extraordinary light feeling, and seemed to be filled with fire-damp, so that had it been made of India-rubber he could have brought away some of the gas." That gave him the idea that the law of diffusion might be so adapted as to furnish an indicator fulfilling the required conditions. Reasoning on this, Mr. Ansell obtained an India-rubber balloon, bound round its centre to prevent lateral expansion, and placed it on a stand, its summit resting on one end of a lever, the opposite extremity being connected with a catch securing a spring-bell in such a position that when liberated the bell would be made to vibrate, and so set ringing. The balloon of the apparatus when introduced into an explosive atmosphere increased its dimensions by reason of diffusion, and its circumference being constricted by a rigid band, that which was previously a globe in shape was obliged to assume an oval or egg-shaped form—the elongation of its perpendicular axis pushing the lever upwards, liberating the bell from its catch, and an alarum was the consequence. That machine, though answering perfectly, was found to be of too fragile a material to bear the rough usage to be expected in a colliery. Mr. Ansell, therefore, modified his invention to another form of apparatus, consisting of an iron funnel provided with an iron tube, the end of which was closed by a piece of glass tube fixed in brass, to which one pole of a battery was attached; the upper part of the glass tube carried a brass collar, through which passed an adjusting screw, to the lower end of which was fastened a piece of copper wire with a platinum point. Mercury was poured into the iron funnel till it went up in the glass tube to a convenient height, the mercury being allowed to find its level by the opening of a valve; when setting the instrument, the mouth of the funnel was closed by a septum of Wedgwood ware. The other wire of the battery was connected with the upper brass collar of the instrument, so that if diffusion took place the mercury was pressed against the platinum point, and thus communication was established. Mr. Ansell has found that his instrument gives warning in four seconds if the mixture of gas is below the point of explosion; but by adjusting the platinum point so that there was not more than the thickness of a shilling between it and the mercury, a dangerous irruption might make itself known in two seconds. A source of great danger was that which arose from the gradual bleeding of gas from coal, which, though very minute, might be such as to render the whole air of the pit explosive if the ventilation was not very good. There were some of our pits where gas might so accumulate in half-an-hour; others where it would be two hours; and again others where it might be a whole day in rising to a dangerous mixture. In order to meet such, it became necessary to use a material less porous than Wedgwood ware; and Mr. Ansell has used Sicilian marble of varying thickness with which to replace the porcelain disc. A disc of marble a quarter of an inch thick would show an explosive mixture which had been half-an-hour in forming; one half an inch thick, a two hours formation, &c. It was proposed to fix the instruments side by side, one for sudden and the other for slow accumulations, in pig-iron holes cast in the iron props used to support the roof—grooves being cut in the sides of the posts for the telegraphic wires communicating with an ordinary magnetic alarm bell placed in the manager's room. The instrument was intended to give warning, but if the amount per cent. of fire-damp present in the air of mines was required, it could be ascertained by an ordinary aneroid barometer, the brass break of which has been removed, and replaced by a Wedgwood disc, that being covered by a brass tap. On taking it into an atmosphere of air and fire-damp, the index would remain stationary, and its position noted as zero; but on removing the brass cap the law of diffusion through the disc came into action, causing pressure on the aneroid chamber, and so moving forward the index. In round numbers, a rise of ·01 was equal to 1 per cent. of gas, and ·10 inch rise to 10 per cent. of gas. The following results were obtained as compared with the Davy lamp:—

Aneroid indicated—	Davy lamp gave—
1·5 per cent.	No sign.
3 ,, ...	Small blue flame.
6 ,, ...	Flame elongated greatly.
8 ,, ...	Exploded feebly.
10 ,, ...	Exploded furiously.

The aneroid also indicated equally the presence of choke damp, the index moving backwards as the gas accumulated. It had been truly said that it was impossible to conceive a more refined application of science than the one alluded to, nor one that would be found of greater practical utility as indicating the presence of fire-damp in collieries before it became dangerous from accumulation.

The lecturer concluded an able, eloquent, and interesting address by quoting the words of Prof. Phillips in his report on Colliery Explosions, that—"However abundant currents of air may be, they are liable to be so misdirected as to yield bad ventilation. The safety-lamp may be so unwisely handled as to endanger the lives it should protect; the best regulations may, if not strictly carried out, become sources of mischief. The general remedies for these errors or crimes are instruction and responsibility—increased knowledge and stronger motives to use it rightly. Knowledge is nowhere more powerful, obedience nowhere more necessary, than in a coal mine."

GEOLOGICAL SOCIETY OF LONDON.

April 8: Prof. T. H. HUXLEY, LL.D., F.R.S. (President), in the chair.—W. F. Webb, Newstead Abbey, Notts; Rev. H. W. Crosskey, Corunna-terrace, Glasgow; G. H. West, B.A., Christ Church, Oxford; T. Anstie, B.A., C.E., Devizes; R. H. Brunton, C.E., George-street, Edinburgh; and H. B. Woodward, of the Geological Survey of England, were elected Fellows of the Society.

The following communications were read:—

1.—"On the Affinities and probable Habits of the extinct Australian Marsupial, *Thylacoleo carnifex*, Owen," by W. H. Flower, F.R.S., F.G.S., &c.

2.—"On the Thickness of the Carboniferous Rocks of the Pendle Range of Hills, Lancashire," by E. Hull, B.A., F.R.S., F.G.S., of the Geological Survey of Scotland. This paper was supplementary to a former communication by the author, in which he endeavoured to prove the south-easterly attenuation of the carboniferous sedimentary strata of the North of England, while the calcareous member (the mountain-limestone) attained its greatest vertical development in Derbyshire, and thence thinned away northward and westward. The author now gave the results of his subsequent investigations while engaged in the survey of the Pendle Range and the neighbourhood of Burnley and Blackburn, which have shown that the increase in the thickness of the sedimentary deposits is continued into that district, the aggregate thickness of the coal measures, the millstone grit, and the Yoredale series being in the Burnley district 18,635 ft., while in Leicestershire it has dwindled down to 3100 ft. In discussing the question of the source of these sediments, the author came to the conclusion they were derived from a primæval Atlantis, a view which he considered to be strengthened by the fact that the carboniferous sedimentary strata of North America also swell out towards the north-east, and become attenuated towards the south and west.

3.—"Observations on the relative Ages of the leading physical Features and Lines of Elevation of the Carboniferous district of Lancashire and Yorkshire," by E. Hull, B.A., F.R.S., of the Geological Survey of Scotland. The author first described the Pendle Range as a great arch of carboniferous rocks, bordered on the north and south by a succession of parallel (W.S.W. to E.N.E.) arches and troughs, to all of which he assigned a pre-Permian age. He regarded them as belonging to the earliest of three consecutive periods of disturbance, to which all the principal flexures and faults of the district may be referred. The Pennine chain, which runs nearly north and south, he believed to have been upheaved during a latter period, namely, the close of the Permian, while the numerous north-west faults of the district under consideration he referred to the close of the Jurassic period. Mr. Hull described in detail the evidence upon which these conclusions rested, observing that immediately upon the close of the carboniferous period the northern limits of the Lancashire and Yorkshire coal fields were determined by the upheaval and denudation of the beds along east and west lines, the coal fields themselves retaining their original continuity across the region now formed of the Pennine Hills, from Skipton southwards. At the close of the Permian period these coal fields were dissevered by the uprising of the area now formed of the Pennine range, by lines of upheaval ranging from north to south, nearly at right angles to the former, this fact being of itself an evidence of difference of age. In conclusion, the author pointed out that the denudation of the rocks of the district may be referred to seven periods, beginning with the commencement of the Permian and ending with the post-glacial; he defined the duration and effect of each of these periods, and stated the evidence on which his conclusions rested.

4.—"On a Saliferous Deposit in St. Domingo," by M. D. Hatch, communicated by Sir R. I. Murchison, Bart., K.C.B., F.R.S., F.G.S., &c.

On Wednesday, the following papers will be read:—1. "On the Distribution of Iron in variegated Strata," by George Maw, F.G.S.—2. "On the older Rocks of South Devon and East Cornwall," by Dr. H. B. Holl, F.G.S.

THE INSTITUTION OF CIVIL ENGINEERS.—At the Ordinary General Meeting on Tuesday, Mr. C. H. Gregory, President in the Chair, twenty-eight Candidates were duly elected, including nine *Members*—Mr. W. C. Barton, Chief Engineer of Travancore; Mr. J. Bower, Whitehall; Mr. W. W. Clarke, Executive Engineer, P.W.D., N.W.P., India; Mr. R. S. Clayton, Ripley; Mr. F. J. Dennys, Resident Engineer to the Salford Water Works Company; Mr. James Mathias, Craven-street; Mr. J. Paton, General Manager and Engineer to the Blaenavon Iron Company; Mr. G. L. Reid, Chief Engineer of the Great Western Railway of Canada; and Mr. David Richmond, Deputy Chief Engineer of the Bombay Baroda, and Central India Railway; and twenty-nine *Associates*—Mr. Herbert G. Anderson, Brighton; Mr. F. C. Barron, Assistant Engineer on the Central Argentine Railway; Mr. Walter T. Blacklock, Manchester; Mr. W. R. Browne, Bristol; Mr. R. H. Brunton, Chief Engineer for Lighthouses, Harbours, Roads, &c., to the Japanese Government; Mr. C. T. Casebourne, West Hartlepool; Mr. R. G. Clutton, Whitehall; Mr. C. H. Croudace, Euston-square; Mr. Henry A. S. Fenner, Assistant Engineer, P.W.D., N.W.P., India; Mr. W. R. I. Hopkins, Middlesborough; Mr. W. S. Howard, Executive Engineer, P.W.D., Bombay; Mr. Alfred Longsdon, New Broad-street; Sir Arthur W. Mackworth, Bart., R.E., Aldershot; Mr. R. Reynolds, Boston; Mr. F. W. Robinson, Assistant Engineer on the Riga-Dunaburg and Dunaburg-Witepsk Railways; Mr. Robert B. Smyth, F.G.S., Secretary for Mines to the Government of Victoria, Melbourne; Mr. W. Sykes, Toronto; Mr. J. J. Wallis, Blaenavon Iron Company, Cannon-street; and Mr. D. W. Young, Westminster.—It was also announced that the Council acting under provisions of Section IV. of the Bye-Laws, had, since the last announcement, admitted as *Students* of the Institution, J. A. Carfrae, J. Malcolm Gibson, Charles Selwyn Harris, George Edward Page, and Frank George Wynne.

SOCIETY OF ENGINEERS.—On Monday evening there will be a discussion on the paper "On the Sewerage Works at Redhill," read on April 6 by Sydney A. Reade, M.A.

Meetings of Public Companies.

THE RIO DE JANEIRO GAS COMPANY.

The annual general meeting of shareholders was held at the London Tavern, on Thursday,—Mr. JAMES ATHERTON in the chair.

The notice convening the meeting was read. The report of the directors, which was taken as read, was as follows:—

The directors, in accordance with the Articles of Association, paid on Oct. 14 last an *ad interim* dividend of 30,000*l.*, being at the rate of 10 per cent. per annum, and have now much pleasure in submitting to the shareholders the statement of accounts for the 12 months ending Dec. 31 last, duly audited, and showing a balance at the credit of profit and loss account of 70,254*l.* 19s. 3d., reduced by the above *ad interim* dividend to 40,254*l.* 19s. 3d. The directors cannot doubt that this result will be deemed highly satisfactory under existing circumstances in Brazil. Out of the above-mentioned sum of 40,254*l.* 19s. 3d. the director recommend that a dividend at the rate of 10 per cent. per annum, also free of income tax, be paid for the half-year ending Dec. 31 last, and which will absorb 30,000*l.*, leaving 10,254*l.* 19s. 3d., which the directors have disposed of as follows:—They have placed 7000*l.* to the insurance and contingency fund, and carried forward to next account 3254*l.* 19s. 3d., out of which income tax for the past year has to be paid. The reserve fund now stands at 4000*l.*, and the insurance and contingency fund at 11,000*l.* Mr. Richard Carruthers is the retiring director, in accordance with the Articles of Association, and being eligible offers himself for re-election. The auditor, Mr. Harding (of the firm of Harding, Whinney, Gibbons, and Co.), also retires, and offers himself for re-election.

The CHAIRMAN said that, as the report had been in the possession of the shareholders for some days, there was very little left for him to say upon the present occasion. He might remark, however, what what was, no doubt, well known to all present, that the war on the part of Brazil with the Dictator of Paraguay had been carried on for three years. He could well understand that when that war was commenced the conviction was on the part of the allies that it would very soon and very satisfactorily terminate. It had, however, proved that the nut had been too hard to crack, for the war had continued, and had been a most serious and grave drain upon the resources of Brazil. The slow progress made created very considerable discontent in Brazil, after the energies displayed in the prosecution of the war. During the last year there could be no doubt that a great deal of dissatisfaction prevailed, and at this critical moment the General-in-Chief made a demand upon the people and Government for a very largely increased payment, to supply him with money and munitions of war. It might, therefore, be readily conceived that great disappointment would prevail; but, under the circumstances, with a heroism which deserved the highest possible praise, the Government and people were determined that, at whatever cost, the war should be prosecuted in such a manner as to bring an early and glorious termination. In the meantime, what had been the result? Trade and commerce, and the industry of Brazil, had been almost sacrificed—every interest, he might say, was blighted, and the currency of the country, which at par was 27d., fell eventually to 13¾d., with every prospect of it going down to 10d.; but a friend of his, a merchant in Brazil, determined he would not sell a piece of merchandise unless he covered the cost and charges at exchange 8d. per $. He mentioned this to show how public feeling had fallen in Brazil. It was under circumstances such as these that the negociations of the business in connection with this company had to be carried out, and he thought he should not be considered presumptuous in saying that the statement the directors had laid before the shareholders to-day—showing, as it did, that they were able to pay 10 per cent., free of income tax, and to add 7000*l.* to the contingency fund, and to carry on to the next account 3254*l.* 19s. 3d.—was a matter upon which he thought he might say he fully and confidently offered the shareholders his sincere and hearty congratulations. He considered that, under the circumstances, the result was most excellent, and he felt assured that those who were intimately acquainted with Brazil would come to the same conclusion. (Hear, hear.) He might here mention that when the prospectus of this company was issued to the public there was a declaration to the effect that there was offered a property that would at once yield not less than 10 per cent. He now called attention to the fact, because the operations of the company had extended over a period of two and a-half and bordering upon three years, and the statement had been verified to the very letter. In no instance had the directors submitted results less than 10 per cent. (Hear, hear.) There was another point to which he would call attention—that is, to the financial position of the company, which all would admit was a very important matter. That, he was glad to say, was most highly satisfactory. It had ever been the anxious desire on the part of the directors that this company should be as early as possible independent of bankers, money-lenders, and everybody else; and they were, he was happy to say, in that proud position, so that everyone connected with the company could lay his head upon his pillow without any anxiety with regard to the morrow—more than that, the directors could go into the market and purchase their Cannel, their coal, and everything else, and pay cash for it. That, he thought, was a matter, looking at the events which had occurred in this country during the last three years, upon which they might with great propriety congratulate themselves. (Hear, hear.) There was one point more that he would just touch upon, although it affected them but in an indirect manner. He had often been in conversation with parties who had thrown into one mass all the South American States as those ever restless South American republics, without making the distinction that Brazil was a monarchy, hereditary, constitutional, representative, and totally differing in its institutions to the republics that surround it. Its press is free, and although the State religion was Roman Catholicism, still liberty of conscience and action was given to every denomination. What was still more, the monarchy of Brazil was the very reflex of the institution and constitution of this country—the humblest man in Brazil was able, if he possessed the talent, to rise to the highest position under the Government. He named this more especially on this account, because it gave to this company a solidity which it could not possess if the property were placed in any of the South American republics. (Hear, hear.) He moved that the report and balance-sheet be received and adopted.

Mr. HOWARD (managing director) seconded the proposition, which was put and carried unanimously.

A resolution was then put, declaring a dividend at the rate of 10 per cent. per annum (free of income tax), for the year 1867.

Mr. HOWARD, in reply to a question by Mr. Smith, stated that the 4000*l.* carried to the reserve fund could not be used for any purpose other than for the equalisation of dividends, while the 7000*l.* was appropriated to an insurance and contingency fund. Upon a previous occasion he entered fully into explanations upon this point, when he stated that one reason for thus adding to that fund was because the works were not insured, therefore there was what might be considered an absolute necessity to set aside a constantly increasing sum out of the profits to meet any contingency that might arise. (Hear, hear.)

The CHAIRMAN said this matter was fully discussed two years since. He thought they had reason to be perfectly satisfied when they considered the proud position the company occupied this day, by exercising economy, and providing themselves with capital to work with, which they had not to begin. They must remember that as soon as the war was terminated, which, no doubt, it would be ere long, the resources of the country would be developed, and its institutions, now paralysed, would revive; there was no doubt an enlarged demand for the gas of the company would ensue, as, indeed, it did last year, and, therefore, they should be in a position to meet the demand for main lines.

Mr. J. PELLY said, so far from thinking that the accounts carried towards the contingency and insurance fund were excessive, he questioned whether they were really large enough. He advocated that the policy of the company lies in its own insurers.—The CHAIRMAN said that Mr. James, the manager of the works at Rio, was present, and would be glad to afford any information shareholders might desire.

A PROPRIETOR had heard that coal had been found within 20 miles of the company's works. He would like to know if they were likely to reap any advantage from the coal in the locality?—Mr. JAMES said the nearest coal field to the works was at St. Catherine's, which was 400 miles distant, and coal had been found in Rio Grande, but that was 800 miles distant. He had never heard that coal had been found in the province of Rio de Janeiro. Rio Grande was a very inaccessible place; but at some future day some advantage might be gained from the coal at St. Catherine's.

Mr. MACGREGOR (a director) remarked that at present it would cost more to get it than it would from this country, as it was situated in a very remote country.—Mr. HARDING was re-appointed auditor.

Upon the proposition of Mr. J. PELLY, seconded by Mr. R. WILSON, a unanimous vote of thanks was passed to the Chairman and directors for the successful manner in which they continued to conduct the company's affairs.

The CHAIRMAN appropriately acknowledged the vote, and stated that he had no doubt at their next meeting the directors would be able to say that such alterations, economies, and improvements had been made as would show a difference of between 3000*l.* and 4000*l.* (Hear, hear.)

The meeting then separated.

JAVALI COMPANY (LIMITED).

The first general meeting of shareholders (which, by the Companies Act, 1867, must be called within four months from the date of incorporation) was held at the offices of the company, on Wednesday,

Mr. A. A. POLLOCK in the chair.

The CHAIRMAN said, "Happy is the company that has no history." That was exactly their case. The present meeting, which he was glad to see so numerously attended, was merely a formal one, and he had very little indeed to communicate. The shares had been well taken up, and the whole expense of bringing out the company did not amount to more than 200*l.* (Cheers.) Strong efforts had been made to induce the board to make a market for the shares; but the directors had, with the advice of their own brokers, Messrs. Sewell Brothers, as strongly resisted. They believed that they had a good property in the Javali, and they thought that it was opportune to return once more to those primitive times when people invested their money in what they held to be a *bona fide* concern, and quietly waited the steady development of it. (Hear, hear.) He was sure that the Javali shares would rise on their own merits, and he, as the largest shareholder, did not wish to see any other. All the dodges and tricks (for they were nothing else) resorted to for giving an artificial value to shares were now well known, and deceived nobody behind the scenes; and he wondered that again and again the necessity had been urged upon the board to spend some of the company's money for a purpose which he considered illegal. Owing to an accident to one of the Royal Mail steamers at St. Thomas's, the West India packet was several days behind its time, or else he might have been able to communicate to the meeting some late particulars about the works now carried on at the Javali. A letter had, however, been received, *via* New York, from their agents at Greytown, stating that they had forwarded the March mail from the Javali, and a remittance of gold by the Royal Mail steamer, and that all was going on well at the mines.

Mr. POLLOCK said, in reply to several questions put to the chair, that they were all aware 7000 shares in excess had been applied for out of the first 40,000, to which a bonus dividend of 17*s.* 6*d.* was attached, and that the applications for the remaining 10,000 had been most satisfactory, but that the allotment list was for the present closed, the board having only within the last week refused to entertain applications for more than 10,000 shares. The suggestions thrown out by this meeting, that whenever the shares were at a good premium they should be offered to the shareholders *pro rata*, had previously been made, but the board desired to retain liberty of action in this matter, and would not pledge themselves to adopt it. He might, however, state that whenever the shares were allotted all the shareholders should participate in the benefits of the allotment. The share certificates and the deferred bonus dividend warrants were nearly ready for delivery, but the date when they might be called for at the office would be made known by circular.

Several other questions having been asked and answered, Mr. HENRY SEWELL proposed, and Mr. J. R. FREWER seconded, the following resolution:—"That this meeting is perfectly satisfied with, and gratified at, the statements made by the Chairman, and desires to express its entire confidence in the management of the board."

The resolution and a vote of thanks to the Chairman having been carried by acclamation, the meeting then separated.

CENTRAL AMERICAN ASSOCIATION (LIMITED).

The adjourned special general meeting, held to confirm the resolutions passed on March 20 for the reduction of the capital of the company to 30,000*l.*, divided into 30,000 shares of 1*l.* each, and the return of 1*l.* per share to the holders of all issued shares upon which the sum of 30*s.* per share is now paid up, was held at the offices of the Association, on Wednesday, April 15. The meeting was numerously attended, and on the motion of the CHAIRMAN (Capt. Bedford Pim, R.N.), the same were unanimously confirmed and adopted. It was announced that at the general meeting, to be held next month, a dividend of 25 per cent. would be declared.

A vote of thanks to the Chairman terminated the proceedings.

NEW GREAT CONSOLS MINING COMPANY.

The first general meeting of shareholders was held at the offices of the company, New Broad-street, on Monday,

Mr. HENRY L. PHILLIPS (managing director) in the chair.

The notice convening the meeting having been read,

The report of the directors stated that the shareholders will doubtless recollect that the erection of a new steam pumping-engine, of much greater power than the engine then erected upon the mine, was the most important object in connection with the re-working of the property, and the directors, therefore, at once determined to erect such an engine as would effectually perform all the work that would be required of it, and insure uninterrupted progress in the development of the property, and they have the pleasure to state that, after considerable negociation, they succeeded in obtaining an 80-in. cylinder pumping-engine, and that the same is now erected and in complete working order. The taking to pieces and removal of the old engine disclosed the fact that the house could not be depended upon to sustain the new engine, and, acting upon the advice of the company's engineers, Messrs. Loam and Son, the engine-house has been substantially rebuilt. The drawing-engine, crusher, and boiler have also been put into proper order, and the various buildings have been repaired. With respect to the development of the property, which will be now regularly proceeded with, the directors entertain but one opinion as to the ultimate results; the favourable situation, the great size of the lode, and the knowledge that it is capable of yielding an enormous quantity of mineral, induce the conviction that a mine of no ordinary character will be opened up. It has already been stated that the quality of the ore improves with increased depth, and it is believed that the mine can be placed in a self-supporting condition as soon as it is drained and in fair course of working, and, therefore, any improvement will be most important to the company. There is no reason whatever to doubt that this will not take place, indeed, a reference to the Ticketing List for May 21, 1863 (which may be seen at page 357 of the *Mining Journal* for that year), will show that 426 tons of copper ore from this property were sold at Truro for 1210*l.* 5*s.* (an average of nearly 2*l.* 17*s.* per ton), and this parcel of ore also included 20 tons which actually realised 8*l.* 15*s.* 6*d.* per ton. The existence of other lodes in the mine, which do not appear to have been touched by the last workers, constitutes an important feature in the development of the property, as by cross-cuts from the present levels at least one most promising lode will be reached; and there is no doubt that their development will add very materially to the permanent value of the mine. The directors have much pleasure in stating that it has been liberally agreed that the dues on the minerals raised shall be reduced to 1-20th, in consideration of the mine being worked in a thoroughly efficient manne.

The CHAIRMAN said he had much pleasure in meeting the shareholders at this, the first, meeting of the New Great Consols Mining Company, and he would take the opportunity of congratulating them upon being the possessors of a property, the attested mineral value of which was so patent, not only to themselves but to the mining public at large, that it were but supererogative to advert thereto upon the present occasion. As far as the present company was concerned, he need hardly say that, viewing the comparatively brief period since the resumption of operations, but little progress had been made in the extension of the underground explorations. Since the failure of the former working arose entirely from inadequate machinery, it was obviously the first duty of the executive to obtain a suitable engine, possessing sufficient power to thoroughly develope this great mine to an increased depth. During its former working attention was repeatedly drawn to it by various mining authorities, all of whom considered it a property of great value, the more especially as it was traversed by the Devon Great Consols lodes. A reference to the Ticketing List would show that in May, 1863, this mine sold a parcel of copper ore amounting to 426 tons, which realised 1210*l.*, some 20 tons having fetched as much as 8*l.* 15*s.* per ton, and the shares were for some months readily marketable at 5*l.* per share. He (the Chairman) recollected that Mr. J. Y. Watson, F.G.S., in his well-known "Cornish Notes," referring to this mine, stated that "the main lode is a strong champion lode, 3 fms. wide, with an enormous amount of mundic in the shallow levels, but improving as it goes down. In the 52 it had fluor-spar in it, and in the 64, where the orey part is 3 feet wide, the fluor-spar predominates even more, improving the lode, taking the place of the mundic, and making it easier to work, for when the lode had to be entirely cut through in the upper levels it cost as much as 50*l.* per fathom. This change in the lode makes me think there may be a good if not a great mine in depth, and at present it is an excellent speculation, spoiled through limited resources. * * * * By a proper and vigorous mode of working, by getting levels extended and ore ground opened out, and by sinking the shaft as quickly as possible 10 or 20 fms. deeper, there may be a fine mine opened out. To show the nature of the lode, I may add that in the 64 west, which has been driven on the course of the lode about 4 fms., it is 24 ft. wide, worth 8*l.* per fathom, and improving; and there are 12 fms. further to drive to get directly under the rich ore gone down in the bottom of the 52." It was obvious, therefore, that Mr. Watson's opinion was that the mine merited a more vigorous development; and it was equally evident that there was practically an inexhaustible supply of mineral, so that the great point for them to attain was to sink the shaft a depth of some 20 fathoms, when there was no doubt the character of the ore would be found of a much richer quality. The first thing to be done, therefore, was to provide the mine with efficient machinery; that had been successfully accomplished by the erection of an 80-in. cylinder engine, which would be able not

only to keep the water that had literally drowned out the previous workers, but would enable them to extend the development of the property upon a scale commensurate with its proved resources. The directors were present at the starting of the engine, and nothing could have been more satisfactory; but as it might be satisfactory to the shareholders to know the opinion of the company's engineers (Messrs. Loam and Sons, of Liskeard) as to its effectiveness and capabilities, he would read their report, which was as follows:—

April 7.—At your request, I have much pleasure in reporting for the general meeting on this engine, its performance and capabilites. It is a first-class 80-in. cylinder engine, and although second-hand it is quite equal to new—in fact, it is practically new, as except the cylinder, which is very good, all the vital parts are new—piston, cylinder, bottoms, nozzles, valves, gear, condensing work, and steam and eduction pipes, &c. We have also thoroughly repaired the three boilers and outfit; and in connection with this we have taken down and rebuilt the engine-house, loadings, and boiler flues, in a substantial manner, suited to the power and requirements of the engine. The outlay has been of necessity heavy, but it is not half that of new work of this class. It has also been longer in hand than was first calculated upon, but the time originally fixed was too limited for the making of what is virtually a new 80-in. cylinder engine; and there was also a delay in the delivery through the detention of the vessel from bad weather. Respecting the performance of the engine, we are pleased to say it is in every respect all that we could wish. It has been working now a month, and making regularly nine strokes of 11 ft. each per minute, with the utmost smoothness and steadiness. At this rate, and with the old pitwork alone, it has pumped out 23,000,000 gallons of water, and drained the mine to the 40 fathom level. It is at and above this point that the largest explorations and greatest quantities of water are. We shall now remove the old pitwork and fix the new plunger, which, with the diminished accumulation of water, will enable us to fork to the bottom of the mine more easily and rapidly. Respecting the capabilities of the engine, upon which the future effectual development of the mine must greatly depend, we can speak with confidence. The new pitwork will be 19 in. instead of the old 14, which will increase its effect upwards of 75 per cent.; this is of the utmost importance. It will give complete mastery of the water, and secure its speedy forking after stoppages, thus ensuring the uninterrupted sinking of the shaft. The power of the engine is equal to this 19 in. lift 160 fms., or 75 fms. below the present bottom level, and will only require an additional boiler when the increased depth shall require the power. You thus see that with the mine in fork only about half the engine power will be required, and, taking the winter speed of the engine to pump the greatest quantity of water at five strokes per minute, it will be only half its effective maximum speed. You have now, in fact, for the first time in the history of the mine, a sufficient and effective engine for its drainage, and one that will also work economically. Looking at the large quantity of water to be pumped from the mine, it will be well to consider, when the mine is in full working order, its utilisation by ponding for winding and crushing, instead of, as an auxilliary to, the present steam-whim and crusher.—LOAM AND SON, Engineers.

The CHAIRMAN then proceeded to state that, as to the practically inexhaustible quantity of the ore which the mine had been proved to contain, he might add that, besides the copper ore, almost any quantity of mundic could be raised, for which there existed a ready market at remunerative prices—indeed, there were firms who were anxious to contract for any quantity. This, he need hardly say, was a great feature in favour of the speedy success of the mine. (Hear, hear.) Capt. Richard Pryor, to whom had been entrusted the conducting of the mine's affairs, was associated with its management during the last few months of its former working. Capt. Pryor was now present, and would be glad to afford the shareholders any additional information they might desire. He (the Chairman) believed Capt. Pryor regarded it as a very valuable property, and that it possessed elements of success second to very few in Cornwall. It possessed the Devon Consols lodes, which, *per se*, was a fact, the prospective importance of which it was impossible to over-rate; and fortunately—through the kindly interposition of Mr. Warington Smyth—they had been able to make a most favourable arrangement with the Duchy in respect of the dues, whereby they had been reduced from 1-16th to 1-20th. The best proof he could give as to his opinion of the property was the large interest he held, and, at the same time, that should be accepted as an assurance that he would continue to do everything to make New Great Consols a speedy and permanent success. (Hear, hear.) He moved that the report and balance-sheet be received and adopted.

Mr. WARD seconded the proposition.

Captain RICHARD PRYOR, replying to enquires from different shareholders, stated that he had let several tribute pitches, at about 10*s.* in 1*l.*; and he hoped during the ensuing week to be able to set many more, and shortly to return from 120 to 200, tons of ore monthly; but as soon as the bottom levels could be resumed he hoped to sample something like 300 tons monthly. They had worked some ground in the 75, but the old company got some very rich ore from the 52, as would be seen by a reference to the Ticketing Lists of 1863.

The CHAIRMAN said if their ore realised only half the price of 20 tons at that sale, New Great Consols would be one of the most profitable mines in Cornwall.

Capt. PRYOR further stated that the former workers saw but little of the bottom level, because, as the Chairman had stated, they were drowned out, owing to the inadequacy of the machinery.

The CHAIRMAN said they had sold 100 tons of mundic to parties at Swansea, by whom they had been treated most unfairly. He did not wish to use harsh terms, or he might call it by some other name. The price, however, at which that mundic was sold left a profit of 60*l.* on the 100 tons.

Capt. PRYOR said there were 150 tons at surface of better class ore.

The CHAIRMAN said that in the last year's working ore to the value of 10,000*l.* was raised. As the property was capable of producing almost any quantity of ore, the slightest improvement in its quality would prove of material consequence.

Capt. PRYOR said that altogether apart from the present workings there was a north lode, which was also another of the Devon Consols lodes.

A SHAREHOLDER said that as the New Great Consols was in such close proximity with the most profitable mines in this country, and that it possessed the same lodes, which had returned for many years immense quantities of ore, he certainly could see no reason whatever why, at no distant date, it should not become a very successful enterprise.

Mr. HOLLANDS asked when the 75 fm. level would be reached?——Capt. PRYOR hoped to reach that point in about six weeks hence. As soon as the mine was got thoroughly in fork the engine would keep the water easily at 3½ strokes per minute. Of course, the principal object in opening out the mine at deeper levels was to return ore of an improved quality. There was an immense lode, which would produce any quantity of ore; but he believed, as did everyone who had seen it, that at deeper levels the quality of the ore would very considerably improve. But there were two lodes, both of which were Devon Great Consols lodes, and that to the south could be cross-cut at a moderate expense; there was also a lead lode, which presented very kindly features. It had never been opened upon north or south of the copper lode. At the next level it could be driven on from the engine-shaft.

Mr. HOWLETT enquired when it was thought the returns would meet the cost?——Capt. PRYOR hoped as soon as the bottom levels were got into working order. During the last working the mine paid its way for the last few months, and the lode began to present an improved appearance, and was producing a better quality of ore than in the upper levels.

The CHAIRMAN said the bottom of the mine had not been seen for five years; and at the time the last workers were compelled to suspend operations it was found that the general character of the mine was improving; and in the 61 fm. level the orey part was 6 ft. wide, presenting a greatly improved appearance. Such, indeed, was the opinion about the mine then that it was selling in the London market at the aggregate value of 50,000*l.*

A SHAREHOLDER said that he was acquainted with one shareholder in the old company, who refused 5*l.* per share for 600 shares.

The CHAIRMAN said the general opinion entertained at that time could not be better represented than by quoting the opinion (which he had already done) of Mr. J. Y. Watson, F.G.S., who, in 1863, believed it would be a very fine mine, if properly developed.

Capt. PRYOR said that at the time the mine was last worked the process of extracting the silver was not known. The first firm who discovered the process was Messrs. Sims, Willyams, and Co., who extracted no less than 7000 ozs. of silver from this ore.

Mr. FLETCHER, who said that he was a shareholder in the old company, enquired the greatest depth at which the lode had been seen?——Capt. PRYOR said it had been seen at the bottom of Broad Gate shaft, which was 8 fms. deeper than the engine-shaft in New Great Consols, and there a better quality of ore could be traced. As soon as the shafts were opened they would be able to return nearly as much ore as from the old mine.

The CHAIRMAN said that was in a portion of the property for which the late adventurers paid a considerable sum of money. He might add that Mr. Warington Smyth had a very good opinion of the mine, and as an additional evidence of its value he might mention that among others a well-known smelting firm at Swansea had been desirous of purchasing the property.——After some further discussion, the report and balance-sheet were received and adopted.

Mr. HOLLANDS asked Capt. Pryor if he saw any reason why the Devon Great Consols lodes in New Great Consols should not prove as profitable as in the former mine?——Capt. PRYOR said he saw no reason whatever why the side lode should not prove equally as rich as it had done in Devon Great Consols.

It was unanimously agreed to make a call of 2*s.* 6*d.* per share. The auditor (Mr. Warwick) was re-elected. Unanimous votes of thanks were passed to the Chairman, directors, and manager.

The CHAIRMAN expressed his confident belief that at the next meeting he would be in a position to congratulate the shareholders not only upon the satisfactory progress that had been made, but also upon the fact that they had commenced a long career of success. (Hear, hear.)

The meeting then separated.

ANGLO-BRAZILIAN GOLD MINING COMPANY.

The fifth ordinary general meeting of shareholders will be held on Tuesday. The report to be submitted states that the directors regret that the result of the past year's operations will not enable them to recommend the declaration of a dividend, but Capt. Treloar's opinion of the ultimate success of the company remains unchanged. The difficulties against which the company have hitherto had to contend have been—the scarcity of force, consequent upon the war with Paraguay, which has necessarily restricted the company's operations—so much so that the reputedly rich portions of the mines have not yet been reached—and the decline in the auriferous quality of the stone obtained. Upon these points Capt. Treloar makes the following highly encouraging remarks:—"Though the lode at Dawson's canoa and the Buraco Secco has declined (temporarily, I believe), and we have not hitherto struck any of the great canoas, yet the mine is so well opened, such an extent of the lode generally laid bare, and so much machinery erected, that we could more than pay cost without the aid of canoas had we but sufficient force to man the different points." The intelligence received by the last mail regarding the war announcing the success of the allies, and reviving hopes of a speedy termination of the struggle, leads to the conclusion that the necessary force for thoroughly prosecuting the works will shortly be available.

The report of Capt. Treloar states that though they are not making profits, still the mine is highly promising. The main part of the property—the Fundao—is yet wholly untried, and it will remain so till drained by the deep adit, but the latter is advancing not so fast as he could wish for want of force, but still advancing in this direction.

The report of the superintendent (Mr. F. S. Symons) states that he had hoped, and his hopes were participated in by all connected with the concern, that the results to date would have been such as to have borne out the data that had been stated in former reports. Such had not been the case; yet when they looked at the large bodies of auriferous lodes that have been developed, that fluctuations in yield have constantly occurred in the stone from these mines, even before they became the company's property, they are in no position yet but to state that the property is one of high promise, and likely to give most remunerative returns. In a quartz mine, where stone has to be broken and raised by hard manual labour, where the more hands are employed the greater are the results obtained, such a want as that of force affects the interest of the concern vitally, and until this want is remedied great things cannot be attained. Certainly, if they had given much higher wages, the force might have been increased, but, once raise the price of labour, it becomes almost an impossibility, without detriment, to again lower it. Taking this weighty matter into consideration, taking also into consideration the fact that on the cessation of hostilities against Paraguay an influx of hands might be expected, it was determined not to alter the original standard, and they have prosecuted the arduous labours in as economical a manner as possible, being buoyed up with the hope that the past want of hands will not be felt in the future. The heavier dead works of the establishment have been completed, and in the forthcoming year the cost of surface labour will be much less than in any previous one. Should the mine cost be heavier, they will at all events have stone to pay for the increased outlay. They have powerful stamping machinery, that can reduce much more than sufficient stone to leave a handsome profit. The shafts are down to the lode, and tramroads laid. Whims are erected, and they have dwellings for a larger force than at present employed, so that they commence the year 1868 with good hopes of a favourable result, seeing that so much heavy dead work has been completed.

FOREIGN MINING AND METALLURGY.

The exports of coal from Belgium declined last year to 3,564,364 tons, as compared with 3,971,772 tons in 1866, showing the rather considerable falling off of 407,408 tons. The present year does not open better than 1867 finished, the exports of coal from Belgium in January having experienced a further decline as compared with January, 1867. Thus, while the exports of Belgian coal amounted in January, 1866, to 345,113 tons, and in January, 1867, to 284,314 tons, they declined in January, 1868, to 267,171 tons, presenting a decline of 17,143 tons upon January, 1867, and of 77,942 tons upon January, 1866. It is almost needless to add that the decline is attributable to the diminished demand from France, for France is almost the sole outlet for Belgian coal. The Low Countries formerly took a certain quantity of Belgian coal, but deliveries to that quarter of Europe are becoming insignificant, and have a tendency to disappear altogether. Thus, in January, 1865, the Low Countries took 19,000 tons of Belgian coal; in January, 1866, this total declined to 14,256 tons; and in January, 1867, to 7478 tons; while in January, 1868, it was only about 4000 tons. The exports of coke from Belgium also declined from 47,622 tons in January, 1867, to 38,898 tons in January this year. The Charlerol and Liége markets have a slightly better tendency, several orders having arrived, not only for domestic coal, but also for all-coming coal for industrial purposes; the situation, nevertheless, remains a difficult one. Certain disturbances which had arisen in the Charlerol basin have, happily, terminated. The basin of the Couchant de Mons suffers the most from depression; transactions continue restricted, and the stock is considerable. Prices reflect the state of affairs, important reductions being made in the case of considerable deliveries. For inferior qualities there is no clearly determined quotation. Freights remain without change; the question of a reduction of dues continues to be agitated by boat-owners.

We note a few miscellaneous facts. It appears from the last report presented to the shareholders in the Ruhe Collieries Company (Aveyron) that the extraction of coal effected by the company in 1867 amounted to 34,320 tons, showing an increase of nearly 4000 tons as compared with 1866. The average sale price rose last year, and an important saving was effected in the cost price. The shareholders approved the accounts presented, and adopted a series of resolutions, sanctioning a fusion of the company with the new Aveyron Collieries and Foundries Company (Decazeville). The consumption of gas would appear to be greatly extending in Paris. Thus, whilst the Parisian Company for Lighting and Heating by Gas sold 56,042,640 cubic metres of gas in 1857, the corresponding total for 1867 was 136,569,762 cubic metres, the result being that while the shareholders received a dividend at the rate of 9 per cent. per annum for 1857, the corresponding dividend for 1867 was at the rate of 23 per cent. per annum. The price of the coal used by the company in 1867 remained rather high, but it is expected that the necessary coal will be obtained at a somewhat cheaper rate in the current year. In consequence of the increased quantity of gas made last year by the company the production of coke was also largely augmented; the quantity which remained on hand at the close of 1867 was, however, only about the same as at the close of 1866, the use of coke for domestic purposes developing itself more and more. The sum derived by the company from the sale of coke last year was 374,880*l.*; gas tar produced last year 33,000*l.*, instead of 26,240*l.*; and ammoniacal liquor 11,360*l.*, instead of 10,200*l.* It appears that certain local mining companies have offered an additional subvention for the construction of the long-talked of, but not yet executed, Granollers and San Juan de las Abadesas Railway (Spain).

The Belgian iron trade presents little material for comment this week. Meetings are announced as follows:—Vieille Montagne Zinc Mines and Foundries Company, April 25, at Angleur; Belgian Collieries Company, April 26, at Mons; Sardo-Belgian Mining and Metallurgical Company, April 29, at Liége; Sars-Longchamps and Bouvy Collieries Company, April 30, at St. Vaast; North of Charleroi Colliery Company, May 2, at Brussels; Sambre and Meuse Mires and Ironworks Company, May 4, at Brussels; Niederfischbach Mines and Foundries Company, May 4, at Brussels.

The Committee of French Forgemasters has announced that the deliberations of the Consultative Committee of Arts and Manufactures on the question of warrants will have no other result than the rendering the conditions of temporary admissions more severe. This result does not completely satisfy French industrials, who would like—at any rate some of them—to see the system of warrants suppressed altogether. The state of the French iron trade has not varied materially; business continues scarce, and prices are comparatively unremunerative. At St. Dizier some lots of good charcoal-made pig for refining have been dealt in at 4*l.* 5*s.* 8*d.* to 4*l.* 6*s.* 6*d.* per ton, but these terms are exceptional, and only apply to small orders; in the case of affairs of a certain importance a reduction would be obtained of 1*s.* 8*d.* to 2*s.* 6*d.* per ton. Iron has been comparatively neglected on the French markets. The report presented to the shareholders in the Loire Mines Company indicated a prosperous state of affairs upon the whole. The profits of 1867 amounted to 62,691*l.*, which admitted of a dividend at the rate of 12*s.* per share, or 10*d.* per share more than was distributed last year. Meetings are announced as follows:—Grand' Combe Mines Company, April 18, at Paris; Gelsenkirchen Collieries Company, April 20, at Paris; Moselle Colliery Company, April 20, at Paris; Belmez Colliery and Metallurgical Company, April 20, at Paris; Aveyron Collieries and Foundries Company, April 24, at Paris; Société Nouvelle des Forges et Chantiers de la Mediterranée, April 28, at Paris; Cauchy-à-la-Tour (Pas-de-Calais) Mines Company, April 28, at Lilliers; Vienne Metallurgical Company (Limited), April 30, at Paris: Carvin Colliery Company, May 3, at Lille; and Centre du Flenu Colliery Company, May 4, at Paris.

The production of coal effected last year at the Aubin Mines by the Orleans Railway Company amounted to 174,942 tons, of which 40,300 tons were consumed by the company's traction service, while 26,098 tons were sold to the public, and 108,544 tons employed for forging purposes. The company manufactured in 1867 at its Aubin works 25,882 tons of rails, which were employed partly in the renewal and maintenance of the old, and partly in the establishment of the new lines undertaken. The Beaume metallic mines, worked by the company near Villefranche, continued to make progress last year; the mines yielded last year 626¾ tons of argentiferous minerals, which produced 12,171*l.*; this sum notably exceeded the cost of exploration and extraction. Altogether, the financial results of the working of the Aubin undertaking and the accessory establishments were favourable last year. It may be added that in 1867 the Orleans Railway Company carried 43,995 tons of coal to Paris, as compared with 19,373 tons in 1866, and 13,371 tons in 1865. It appears that, after all, the Orleans Company has failed to become a purchaser of the Decazeville Mines and Ironworks, the parties having failed to come to terms at the last moment. The supply of coal is certainly a grave element in the management of the Orleans Company, seeing that it now consumes annually 200,000 tons.

The French copper markets continue firm. At Havre some considerable affairs have been concluded, 89 tons of disposable having been dealt in at 76*l.* to 77*l.* per ton, Paris conditions; 135 tons to be delivered at the close of April have brought 76*l.* to 77*l.* 10*s.*, and 122 tons to be delivered at the end of May 77*l.* to 78*l.* per ton. At Paris, Chilian in bars has risen from 75*l.* 10*s.* to 77*l.*; ditto in ingots from 79*l.* 10*s.* to 80*l.* per ton; Corocoro minerals making 77*l.* per ton. At Marseilles the amount of business done has been somewhat limited, but, nevertheless, a slight advance has been noted in the article. The good tone of the article in France and England is reflected on the various German markets; there has been a certain return of activity on the Hamburg market, where copper had been for some time in comparatively moderate demand. We have already made known the result of the public sale of tin held at Rotterdam; a letter on the subject says—"It was generally believed that the 51,089 ingots offered at the sale would be slowly taken off at from 53¼ fls. to 54 fls., but the surprise was great when a price of 54¾ fls. was announced, and it was not without hesitation that 55 fls. were offered for the 10,600 ingots, which were alone disposed of, the surplus, or 40,489 ingots, being withdrawn from the sale. The direction of the Society of Commerce has not yet made known its intentions in presence of this circumstance, but as it appears for the present decided not to sell below 55 fls., some parties are endeavouring to depress the market as much as possible, so as to annihilate as far as they can the effect produced by the result obtained. Success does not appear to crown their efforts, as since the day of sale an upward movement has prevailed. Thus 500 ingots of Banca have obtained 55¼ fls.; 1400 blocks, 55½ fls.; and finally 3800 blocks have made 56¼ fls.: the market closing with a quotation of 56½ fls., a price which had not been attained for some time past. Billiton has followed the upward movement, and is quoted now at 55¼ fls." The Paris tin market has been firm, and prices have displayed an upward tendency; Banca has made the sum of 99*l.* to 99*l.* 10*s.*; Straits, 97*l.*; and English, 96*l.* 10*s.* to 97*l.* There has been no sensible modification in the official quotation of the German markets; nevertheless, in presence of the favourable advices received from Holland and England, prices have hardened, and display a tendency upwards. There is little change to note with regard to lead; at Paris and Marseilles the tone of the article is satisfactory, and previous prices have been maintained with firmness. The price of zinc has displayed little or no change at Paris; rough Silesian has made 21*l.* 12*s.*; zinc from other sources, 21*l.* 8*s.*; and rolled Vieille Montagne zinc, 28*l.* per ton. Advices from Hamburg with respect to zinc present little interest; the market has been quiet, and there has been no transaction worth mentioning. At Breslau the aspect of the market has been a little less animated; nevertheless, the general tendency of business is still rather good, supplies being rather restricted.

A rather important contract is announced by the French general administration of telegraphic lines, tenders being invited for the supply of 1500 tons of galvanised iron-wire. The quantity is to be divided into six lots of 250 tons each.

SALT BEDS OF NEVADA, U.S.

[*From our Correspondent.*]

The salt beds constitute not only a notable feature in the chorography, but also an important item in the economical resources of Nevada. As salt it is used to a great extent in the calcination or chloridising of silver ores, all ores taken from below the permanent water level requiring from 5 to 10 per cent. of salt in their reduction. There are a number of these salt fields in different parts of the State; they, like the alkali flats and mud lakes, being confined to the valleys and plains, in which they cover the points of greatest depression, the most of them being adjacent to or encompassed by a belt of alkali lands. The heavier deposits are, no doubt, of lacustrine origin, occupying what were formerly the basins of inland seas, or extended salt lakes. Their formation, it would seem probable, was brought about by the subsidence of these lakes, through evaporation or other more violent causes, whereby the entire saline contents of their waters were collected and precipitated at these points, the stratum of clay interposed between the different layers of salt being the result of floods occurring at various periods. Situate, however, in the valleys, from which the waters, having no escape, spread out over large surfaces, and soon evaporate, leaving the salt and other solid substances with which they are charged behind, the formation of these saliniferous beds may, perhaps, be sufficiently accounted for by the agents and operations now in action, without pre-supposing the existence of others about which less is known. Of the considerable number found in the State, three of these beds at least merit special notice, because of the abundance and purity of their product, and the facility with which it can be gathered. That at Sand Springs, Churchill county, 70 miles east of Virginia city, extends over several hundred acres, a portion of it being covered with water to the depth of a few inches. Under this is a stratum of pure coarse salt, nearly 1 foot thick, and which only requires to be gathered in heaps, or thrown on a platform, in order to drain off the water, which is soon accomplished, when it is ready for sacking. Under this top layer is another, composed of clay of equal, and in places of greater, thickness, beneath which again occurs another body of salt, but of what magnitude is not known, the ascertainment of this point being of no practical moment, inasmuch as the salt taken out above immediately re-forms, the space soon filling up with new depositions from the super-saturated water. This bed is owned by a company, who take out from it over half a million pounds of salt per month, the mills and reduction works about Virginia city obtaining their supplies here, and consuming the most of this large quantity, a little being ground up for table use. The company dispose of this salt ready for sacking at $20 per ton on the ground, the freight to Virginia being about $30. Having their own teams, however, they are able to deliver it at the mills for $40 a ton, a sum considerably below what the freight alone would be for transporting the article from San Francisco, whence, for several years, at first it was wholly derived, the freights at that time varying from $120 to $180 per ton. At these prices, adding first cost—say, $12 per ton—many thousand tons were consumed by the mills in Nevada prior to 1863, when they began packing it in from the salt pools situate 45 miles south-east of Walker Lake, whereby the price was somewhat reduced. These pools, like the water at Sand Springs, being super-saturated with salt, deposit it to a depth of several inches about their borders, renewing it in a short time when taken away. After the discovery of the bed at Sand Springs, it being much nearer to Virginia, salt ceased to be brought to that place from these pools, though the mills about Aurora continue to obtain their supplies thence. To the cheapened price of this commodity is the present diminished cost of reducing silver ores in Nevada somewhat due, the annual saving thus effected being in some of the larger establishments equivalent to $100,000 or more.

About 50 miles north of Sand Springs, being also in Churchill county, though near the line of Humboldt, is another, and still more extensive, salt bed than that already described, its superficial area being nearly 20 square miles. It does not differ, except in extent, from that at Sand Springs; the water here instead of covering coming only to within a few inches of the surface. At this place there is first an inch of dry white salt on top, then 6 in. of wet, overlying a stratum of tough mud, or blue clay, 1½ ft. thick, and filled with cubical crystals of salt; some of them several inches square, and bearing a strong resemblance to ice. Under this clay comes another layer of clean, coarse salt, reaching downward to an unknown depth. This field is also owned by a company, who have erected a railway for running out, a platform for dressing, and a house for storing their salt. Owing to its distance from the chief point of consumption—Virginia city—but little of this salt has been sent to that place, though the Humboldt mills and those at Austin in part have drawn from here their supply. Large as is this bed, it is surpassed by another situate in Nye county. This deposit is about 120 miles S.S.W. from Austin, and about 60 miles in the same direction from Belmont, the shire town of Nye county; this bed covers more than 50 square miles, over nearly all which the salt, clean, dry, and white, being the pure chloride of sodium, lies to a depth varying from 6 in. to 2 ft. This is the surface deposit, what there may be below never having been ascertained; nor does it matter, the amount in sight being ample to supply the wants of the whole world for centuries, could it but be readily furnished at the points required; and though at present of so little avail, when railroads come to be extended into these regions there is no doubt but salt can be supplied to California, and perhaps to more distant localities, with profit. Though sold on the ground by the companies claiming these beds at 1*c.* per lb., and sometimes for less, this salt should be afforded at a price scarcely more than the bare cost of gathering it up—in most instances a mere nominal sum. Upon the great saliniferous field of Nye county millions of tons could be shovelled up, lying dry and pure upon the surface to a depth varying from 6 in. to 3 ft., with, most likely, still more heavy bodies below. This, like the more limited beds elsewhere, is claimed by private individuals, either under some of the various land laws of the United States, or enactments of the State of Nevada; or, perhaps, by virtue of certain regulations, similar to those adopted by the mining community, and which hitherto have constituted the tenure of the mining property, which tenure is invariably respected, not only by the State, but as well by the United States courts.

Besides these more extensive beds, there are numerous plains upon which the salt is deposited to the depth of an inch or more by the process of effervescence, the soil being damp, and impregnated with saline matters to a greater or less degree. At these spots the salt, generally mixed with a small percentage of foreign matter, such as soda, lime, or magnesia, is gathered by simply scraping it in heaps upon the surface, which operation must be performed in the dry season, the smallest amount of rain causing it to dissolve and wholly disappear. It reforms, however, with fair weather, and when removed is speedily replaced by new depositions, being in this respect, like the heavier beds, practically inexhaustible. This admixture of foreign matter does not seem to impair its value for the reduction of ores, though rendering it unfit for culinary purposes. From one of these plains, situated in the Big Smoky Valley, 40 miles south of Austin, the mills at that place and elsewhere, in the Reese River region, obtain their principal supplies of salt, it being furnished on the ground at 1 cent. a pound; and as the average cost of hauling to the mills is not over $20 per ton, the latter get this articles at a comparatively moderate price. Upon these salt fields there are no signs of animal or vegetable life, though it is a singular circumstance that coming up through the saline incrustation, near the edge of the largest of them, is a fine spring of pure cold water, similar springs being found either upon or in close juxtaposition to others. The deposits of salt in this region are not confined to these beds or plains; it sometimes occurs in elevated positions, the strata often, in the aggregate, many feet thick, being embedded in hills and mounds of such extent as to almost justify their being called mountains. One of these, situated in the newly-organised county of Lincoln, in the extreme south-eastern corner of the State, covers an area of several thousand acres, the layers being composed of cubical blocks of salt, often 1 foot square, nearly pure, and as transparent as window glass. There are elsewhere in the State other mounds of salt, the strata separated by layers of earth, similar to this, but none, so far as known, of equal magnitude.

DESULPHURISING IRON ORE.—Mr. ALEXANDER HAMAR, of New York, U.S., proposes to desulphurise the ore by mixing hydrogen with it through the medium of the blast. A heated chamber is filled with coarse iron filings, and with charcoal in lumps about the size of a cherry, in the proportion of about two-thirds iron filings and one-third charcoal. Steam is injected into this chamber, and is partially deoxidised by passing through the iron filings and charcoa', after which it passes through a coil of highly heated pipes, contained in a heating chamber warmed by gases. In passing through the heated pipes the steam is still further deoxidised by the absorption of its oxygen by the pipes. It is then conducted to the lower part of the furnace, whence the pipe divides into branches, corresponding in number with the tuyeres, into which he introduces the deoxidised steam. The steam thus deoxidised is nearly pure hydrogon. A blast of hot air is thrown in through the pipes, in the usual way, and, after mingling with the deoxidised steam, passes into the furnace and mingles with the charge, thus producing a high degree of heat. The hydrogen of the steam also combines with the sulphur contained in the fuel as well as with that of the ore, to form sulphuretted hydrogen, which escapes with the other volatile products of combustion. He thus desulphurises the metal and economises fuel. The invention is adaptable to the cupola or to the puddling furnace. In the latter the ore and fuel are desulphurised separately, and the products of each conveyed away by separate channels.

IMPROVED DRIFT.—Mr. AMOS SHEPARD, of New Britain, Conn., describes an ingenious and very simple form of drift in the *Scientific American*. He says—I first make the steel blank square, straight or tapering as desired, then with a half-round file I begin at one corner of the end and file a groove obliquely across one side of the blank, then turn the blank toward me, and in like manner file a like groove on the next side and so on, forming a thread. I then begin at the opposite corner from where I first began and proceed as before, when I have two threads, or a double right-handed thread. I then, in like manner, file two left-handed grooves, taking care that they intersect the right-handed ones at the corners of the tool. The grooves should be filed under, making the threads a little hooked toward the end. When the grooves are finished as described each side of the tool shows a series of triangles, the planes of which are then filed back, care being taken not to lessen the lower corners and the tool is ready to harden and temper. The main object of this invention is to make a drift that will give a good cut at the corners. The teeth running spirally around the tool can be filed back without injury to the corners. The chips or cuttings will not clog, but will either follow the grooves around the tool or zig-zag up its sides. The grooves being spiral do not make a checked place around the tool and weaken it, as it is the case with the ordinary drift. For light and fine work, its great strength and the ease with which it cuts will make this tool highly prized by all machinists.

Mining Correspondence.

BRITISH MINES.

ABRAHAM CONSOLS.—J. Vivian, April 16: In sinking No. 2 shaft the lode is opening larger, and shows indications of an improvement; we have taken good specimens of tin from it this week. The rock about it is more promising for tin.

BEDOL-AUR.—H. R. Harvey, April 16: T. Jones's pitch is yielding about 10 cwts. per fathom, Leigh's pitch about 7 cwts. per fathom, J. Jones's pitch 5 cwts. per fathom, and Oares's pitch 5 cwts. of lead ore per fathom. There is no change in the workings at the bottom of the mine.

BOTTLE HILL.—J. Eddy, April 16: The south lode, west of shaft, in the 24 fm. level, is about 3 ft. wide, and producing good work for tin. We have found the ground here rather harder for working this last week. The lode east in the same level is about the same as to size and quality as when reported last.—Main lode: The lode in the 24 fm. level is from 5 to 6 ft. wide, and turning out better quality tin-stuff than it has for some time past. The lode in the 12 fm. level is about 5 feet wide, and still continues to yield good stamps work.

BRONFLOYD UNITED.—T. Kemp, April 15: The men have completed their bargains to put the shaft down 3 fms. under the 63, and I have again let them 6 ft., or to cut the south wall of the lode, at 12l. per fathom. The lode west of cross-cut in the 63 continues without change, and is worth from 2½ to 3 tons per fathom. The lode in the 52 fm. level end, east of Barton's cross-cut, is poor, and the ground rather stiff for progress. The stope under the 52 is worth 35 cwts. of ore per cubic fathom. The stopes above the 52 are producing on an average 20 cwts. of ore per cubic fathom. The mine is looking well throughout.

BWADRAIN CONSOLS.—R. Northey, April 11: We have resumed the driving of the 45 west; no change to report. We have cross-cut north in the 35, but, having been satisfied that no more lode stands in that direction, we have resumed driving west on its course. No change in the 25 since I last reported. The lode in the 10 is as last reported. The rise in the back of the 10 fm. level is worth 1 ton per fathom. The stopes are producing their usual quantities of ore. The water for dressing has become very little, but we are doing as much as we can in that department, and hope to sample on Thursday next 50 tons of ore. We are busy about the cutting and other work for the line of new rods, which work will be carried on without delay.

BWLCH CONSOLS.—R. Northey, April 13: The lode in the 30 is without change since last reported. The stopes in back of this level yield their usual quantities of ore, and are likely to do so, as it is all lead-bearing ground from this point up to surface. The lode in the 40 is 1 ft. wide, carrying spots of lead. The stopes in the back of this level will average 1 ton 10 cwts. per fathom. The lode in the 50 is 2 ft. 6 in. wide, and worth 1½ ton per fathom. The lode in the 60 is 3 feet wide, and worth 8 cwts. per fathom. The lode in the 70 is 4 ft. wide, and worth 12 cwts. per fathom. We are going on well towards another sampling, and shall sample on Thursday next, the 16th inst., 55 tons of the usual quality ore.

CAPE CORNWALL.—R. Pryor, F. Hosking, April 15: The lode in the 100, east of engine-shaft, continues to improve in appearance and character, and the end is letting out more water. The 70 fm. level cross-cut men are engaged in putting in air-pipes, which will pushed on with all speed, in order that no time may be lost in cutting the caunter lode.

CARADON CONSOLS.—S. Bennetts, April 14: The lode in the 78 west is from 2 to 3 ft. wide, but somewhat unsettled as yet. A foot of the south part contains some good black and yellow ore, mixed with fluor-spar, prian and peach. The 68 west is producing a little more ore than it was last week. The lode in the winze has not altered much.

CARNARVONSHIRE CONSOLS.—John Kitto, April 16: Coed Mawr Pool: The 20 west, on the main lode, is without change since my last report; but the same level driving east, on same lode, has further improved, and is now opening out profitable ground for stopes. At the same level (the 20), driving south towards the clay shaft, the lode has slightly improved, and is now laying open good tribute ground, the best being in the sole of the level, which augurs well for the 30 fm. level.—Pencraig: We have completed the shaft 16 yards below the adit, and have commenced to drive out a level both north and south, in good orey ground, worth from 12 to 15 cwts. of lead per fathom, and, judging from present prospects, we shall soon open out some good stopes in this part of the mine; but, of course, this ground will not be available for stoping until the ends have advanced a few fathoms each way from the shaft. The driving of the deep adit level is progressing satisfactorily, being now in about 35 fms. under cover; the end is letting out more water than usual, and the ground is in every way congenial for lead.

CENTRAL SNAILBEACH.—John Kitto, April 16: The sinking of the engine-shaft below the 164 yard level is progressing satisfactorily; now down about 12 yards below the level. The lode in the 164 yard level, driving west from the engine-shaft, is about 4 ft. wide, and looks more promising than I have seen it for a long time; it contains more carbonate of lime than usual, and its general character is such as will warrant the anticipation of a speedy improvement. The lode in the sump sinking below the 164 yard level improves as it goes down, and is now worth about 2 tons of ore per fathom, with every appearance of further improvement; in fact, the prospects altogether are encouraging, and, in my opinion, can scarcely fail to be increasingly so as we progress.

CHANTICLEER.—W. Wasley, April 16: Since my last report, in driving the 110 yard level west of shaft, we have cut what I think to be a cross lode, which is running about 50° more to the right than the course of the main lode. It is composed of clay, spar, and fine lumps of ore, and has altogether a very kindly appearance. We have driven 2 yards on it, from which we got about 6 cwts. of ore; and as the lode and ground look so favourable, we shall drive a few yards further on its course.

CRELAKE.—W. Skewis, W. Hooper, April 15: The lode in the rise in back of the 74 west is worth 7l. per fathom. The lode in the 62 west was yesterday cut off by a slide, and is not as yet intersected to the west of it. The lode in No. 1 stope, in back of this level, is 2 feet wide, worth 5l. per fathom; and in No. 2 stope the lode is 3 ft. wide, worth 12l. per fathom. The lode in the 50 west is 2 ft. wide, but of too disordered a character to produce mineral to value. We are still continuing the cross-cut north, but as yet no lode or branch has been met with of any importance; another 2 or 3 fms. should prove this to our satisfaction. The lode in No. 3 stope, in back of this level, is 3 ft. wide, worth 13l. per fathom. The lode in the 40 west is 1½ ft. wide, composed of mundic, spar, and copper ore. In No. 2 cross-cut south, at this level, we have intersected two branches, about 6 to 8 in. wide, containing spar, mundic, but no copper to value. From the increase of water now in the end, we think that there is still more lode to be met with. The lode in No. 3 stope, in back of this level, is 2 ft. wide, worth 11l. per fathom. In the 28 west the lode is 2 ft. wide, containing mundic, capel, and copper ore, worth 4l. per fathom. The lode in 2 No. stope, in back of this level, is 2 ft. wide, worth 8l. per fathom; and in No. 3 stope, the lode is 2½ ft. wide, worth 11l. per fathom. There is no change in the pitches.

CWM ERFIN.—April 14: We continue to drive on the north part of the lode in the 10, where we are breaking some very good work. The branch is 9 inches wide, and is worth 1 ton of lead ore per fathom. The lode in the deep adit level, going east of the boundary, is still open and vughy, composed of clay-slate, veins of quartz, and stones of mundic—unproductive of lead ore. The ground is good for progress, the level being now driven at 4l. 10s. per fm. The lode in the rise over the back of ditto has slightly improved since last reported. We have 24 men employed in the various stopes over the back of the deep adit level, the lode yielding on an average 18 cwts. to 1 ton of ore per fathom. The lode at Taylor's drift, east of the boundary, is 2 ft. wide, composed of killas and spots of mundic; the wall of the lode is flat, and anything but promising. We are cross-cutting south in this level, east of the slide, to prove whether or not any part of the lode has been thrown in that direction. The stope over the back of Taylor's drift continues to open out very satisfactorily; we have 16 men employed in the same, the lode varying from 3 to 9 ft. wide, and will produce 1 ton of lead ore per fathom. Taylor's drift, going west, has been communicated with the old men's workings, which we find to be principally filled up with deads, or poor stuff. We have about 4 fms. of ground to rise through, when we shall be able to clear sufficient deads as to be able to work some of this ground to advantage. Our drawing and dressing are being carried on with good spirit, and we have made good progress towards our next sampling.

DEEP LEVEL.—April 15: The lode in the deep adit level, west of junction, on Pant-y-Go vein, is about 20 in. wide, principally composed of spar, and showing strong spots of blende, in hard ground. In the deep level, going south-west on deep level vein, the lode is about 2 ft. wide, composed of spar and limestone, and yielding 14 cwts. of lead ore per fathom. The vein is looking more promising than it was, and we hope it will open out some productive ground, as the level is extended south-westward. The lode in the pitch over this level, behind the present end, is about 18 in. wide, producing 10 cwts. of lead ore per fathom. There is no change to notice in the cross-cut at the 204, in the bottom of Eyton shaft, driving north towards Pant-y-Go vein. The 174 yard level, west of Pant-y-Go shaft, on Pant-y-Go vein, is still in old workings above, and below, and before us. The vein on the old workings, where we are clearing the level, at present is small, being about 8 in. wide. We are very sorry that we have not yet been able to find the bottom, near the end of the old men's workings in this direction. It appears that they have worked out this vein to a much greater length and depth than we expected. At the Trustees' shaft we have got to the bottom of the old men's shaft, which is 108 yards deep below the surface; the bottom of the shaft is in limestone. We have thought it advisable to drive the old men's cross-cut north to Pant-y-Go vein, to see what distance the vein is from the shaft, and also to see if the vein is worked away in that direction. There is nothing new from the old pitches; we set all the ground we possibly can on tribute. We sold 45 tons of ore at Holywell, on Thursday, at 11l. 15s. 6d.

DEVON AND CORNWALL.—Captain Neil, April 14: George and Charlotte: The lode driving west of cross-cut is producing good stones of ore.—William and Mary: The lode in the 34 east is worth 2 tons of ore per fathom. The lode in the 34 west is still worth 8 tons of ore per fathom.

EAST BOTTLE HILL.—J. Eddy, April 16: We are continuing our driving east of the cross-cut on No. 1 or copper lode; the ground has now become easier for driving, the water very much increased in the end, and strongly mineralised. I believe we are very near the large cross-course, east of which I expect to meet with a good lode. I am happy to state that our north lode has very much improved both in size and quality; now turning out some rich work for tin.

EAST CARN BREA.—I. Richards, April 14: The lode in Thomas's engine-shaft is 15 in. wide, consisting of quartz, mundic, fluor, and a little copper ore.—Thomas's Engine-shaft—No. 3 Lode: In the 80 east the lode is 1 ft. wide, composed of capel, quartz, mundic, fluor, and stones of copper ore. The lode in the 80 west is 2 feet wide, and worth 1 ton of copper ore per fathom. The ground in Davies's cross-cut continues favourable for progress. The lode in the 50, east and west of Williams's cross-cut, is 1 ft. wide, composed of capel, mundic, and a little copper ore. The lode in Tonkins's rise, in the back of the 50, east of Williams's cross-cut, is small and poor. The lode in the 40 west is 1½ ft. wide, and worth 2 tons of copper ore per fathom. The lode in Williams's rise, in the back of the 50 west, is 1½ ft. wide, and worth 2 tons of copper ore per fathom.—Buckley's Shaft—No. 6 Lode: The lode in the 50 west is 1 ft. wide, composed of capel, quartz, mundic, fluor, and a little copper ore. The lode in the 40 west is 1½ ft. wide, composed of capel, quartz, mundic, and very fine stones of tin and copper ore.

EAST GUNNISLAKE.—J. Bray, April 16: There is no change in the 36 cross-cut. The lode in the shallow adit is 6 feet wide; it is composed of spar, peach, and mundic, disseminated with ore throughout a fine-looking lode. The tributers are working with good spirit, and are getting good wages. The end on the Impham lode continues poor; it is at present disordered by a slide.

EAST ROSEWARNE.—C. Glasson, April 9: In King's shaft, sinking below the 105 the lode is 12 in. wide, worth 7l. per fathom. In the 105 west the lode is 8 in. wide, producing stones of ore, but not enough to value. In the 105 east the lode is 12 in. wide, worth 4l. per fathom. In the 95, west of shaft, the lode is 12 in. wide, worth 7l. per fathom. In the 95, east of shaft, the lode is 15 in. wide, worth 4l. per fathom. In the 85, west of shaft, the lode is 12 in. wide, worth 8l. per fathom. The stopes in the back of the 105, east of shaft, are worth 6l. per fathom. Two stopes in the back of the 95, west of shaft, are worth 6l. per fathom each. Three stopes in the back of the 85, west of shaft, are worth 7l. per fathom each.

EAST ROSEWARNE.—C. Glasson, April 16: At King's shaft, sinking below the 105, the lode is 10 in. wide, worth 7l. per fm.; the lode in the 105 fm. level, west of shaft, is very much the same as when reported upon last week—8 inches wide, producing stones of copper ore. In the 105 fm. level, east of shaft, the lode is 10 in. wide, worth 3l. per fm. In the 95, west of shaft, the lode is 8 in. wide, worth 6l. per fm. In the 95, east of shaft, the lode is 12 in. wide, worth 3l. per fm. In the 85 fathom level, west of shaft, the lode is 10 in. wide, worth 8l. per fathom.

EAST WHEAL GRENVILLE.—G. R. Odgers, Wm. Bennetts, April 11: The lode in the engine-shaft, sinking below the 110, is 18 in. wide, which has very much improved; from the appearance of it to-day it will produce 2 tons of good copper ore to the fathom; this is the best thing we have seen in the shaft since we left the 65 fm. level; therefore, taking this and the 95 east, on the caunter, into account, we believe we are not too sanguine in stating that we think these points are likely to lead to something good.

EAST WHEAL GRENVILLE.—G. R. Odgers, W. Bennetts, April 15: The lode in the engine-shaft sinking below the 110 is looking much the same as we stated on Monday, in fact, no lode has since been taken down, but there continues to be a good lode going down, worth fully 2 tons of good copper ore per fathom; this is a good point. The lode in the 110 east is 20 inches wide, producing a little tin, but not to value; this end we are pushing on with all speed, as we want to get under the junction of the caunter and main lodes. The lode in the 110 west is worth for ore and tin 7l. per fathom. The lode in the 95 east, on the caunter, is 2½ to 3 feet wide, and worth for tin from 12l. to 15l. per fathom. The lode in the rise above this level (95) is 2½ feet wide—a good lode for tin, worth from assays fully 20l. per fathom, and this part is going up in whole ground.

EAST WHEAL RUSSELL.—W. Richards, April 15: The north lode in the 100, east and west of the cross-cut, will produce 1½ ton of yellow copper ore per fathom. The south lode in the 130 east is 2 feet wide, and very promising, containing quartz, prian, mundic, and good stones of copper ore. There is no change to notice in the other points.

GAWTON COPPER.—G. Rowe, G. Rowe, jun., April 11: The lode in the 70 fm. level west has improved in character, and is looking exceedingly kindly, worth 4 tons of ore per fathom. The lode in the 70 east is over 8 ft. wide, principally composed of capel, very strong mundic, intermixed with ore, and of a very kindly appearance. The lode in the 60 east is worth 5 tons of ore per fathom. The lode in the stopes in bottom of the 60 west is worth 3 tons of ore per fathom. The stopes in the back of this level have improved, worth 3½ tons of ore per fathom. Viant's stope, in the back of the 50 east, has also improved, worth 3½ tons of ore per fathom. The orey part of the lode in the winze sinking below the 36 has not been taken down during the past week. All other points of operation are without change since last reported on.

GREAT MONA.—John Trewin: The lode at the bottom of the engine-shaft consists of a very kindly quartz, killas, &c., mixed with mundic, blende, copper, and lead ores, and is more promising than for some time past. The ground is getting into a more settled state, and also more mineralised than when I wrote to you on the 3d inst. The machinery is in perfect working order.

GREAT NORTH DOWNS.—William Rich, Cornelius Bawden, April 15: The lode in the 84, west of King's, is worth 15l. per fathom. The 74, west of Sleggan's, is worth 8l. per fathom. The 64, east of Butler's, is worth 10l. per fathom. The 64, west of winze, is worth 10l. per fm. Butler's shaft is worth 8l. per fm. There is nothing new to report on at Sleggan's and Vivian's engine-shafts. We have sampled to-day (computed) 480 tons of copper ore.

GREAT NORTH LAXEY.—R. Rowe, April 9: The only change in the engine-shaft, sinking below the 96, since my last report is a further increase of water; the lode is about 3 feet wide, and yielding stones of ore. In the 96 fm. level end, driving north, the lode is still 4 feet wide, and worth about ½ ton of lead per fathom, with every appearance to increase in value as we go ahead. I am glad to say that we have an improvement in the 84, driving north, having come upon a nice rib of ore in the bottom of the end, worth quite ½ ton to the fathom; I am in great hopes that this will prove to be the beginning of a new section of ore ground, and thus realise the object in view by the continuation of this level into fresh ground northwards. The lode in the sump, sinking below this level, is not so good as last reported, now worth 1 ton of ore to the fathom; the most productive part appears to dip to the north as we sink. In the 73, driving south, the lode is again smaller, now 3 feet wide, and still containing good stones of lead and blende. The stopes in the roof of the 60 fm. level are worth 1 ton of lead per fathom.

GREAT RETALLACK.—G. R. Odgers, April 11: I have to-day set the engine-house to build, at 2s. 3d. per perch, the house to be in readiness for the engineers by May 25 to heave in the engine, or to forfeit the sum of 5l.; also the windows to make at 1s. 3d. per foot.

GREAT SOUTH CHIVERTON.—J. Nancarrow, J. George, April 14: There is a very fine-looking lode in the 20 east, and the end looks as if it would get into lead just at once. The lode in the 30 west is large, and harder than usual. The 40 west looks more promising, and the lode is getting softer as we approach the lead ground before us. The 50 east is a very promising end; the lode is 4 ft. wide, with more flookan and much less underlie than before. The ground in the 50 north is a compact lead-bearing killas.

GREAT SOUTH TOLGUS.—John Daw, April 15: Friday last was setting-day. We set Noel's shaft to sink below the 150, by six men, at 14l. per fathom; the lode is 1 foot wide, producing 2 tons of ore per fathom. In the 150, east of Noel's shaft, the lode is 2 feet wide, producing 3 tons of ore per fathom; set to six men, at 3l. 10s. per fathom. In the 150, west of Noel's shaft, the lode is 1 foot wide, producing 1½ ton of ore per fathom; set to four men, at 4l. 10s. per fathom. In the 150, east of new shaft, the lode is 1 foot wide, producing stones of ore; set to four men, at 3l. 10s. per fathom. In the 140, east of Noel's shaft, the lode is small and disordered; set to six men, at 4l. per fm. In the 125, east of Noel's shaft, the lode is 1 foot wide, producing 1 ton of ore per fathom; set to four men, at 3l. 10s. per fathom.

GREAT WHEAL BADDERN.—Richard Pryor, H. Tregoning, April 11: Hill Brothers Engine-Shaft: In the 75 fm. level cross-cut south the ground in the present end has every appearance to change shortly, as the water is pouring forth from every vein, crevice, and head intervening throughout, and so much so that we cannot make that progress in the driving as we should wish; we believe that we shall get through the elvan very soon now. In the 75 fm. level end, west from the cross-cut, the lode is about 2 ft. wide, producing mundic, lead, flookan, and spar; the ground is just the same for driving as for some time past, and water continually flowing from the elvan and lode in increased quantities.

GUNNISLAKE (Clitters).—W. Skewis, J. C. Seccombe, April 15: The lode in the 23 is 2 ft. wide, worth 20l. per fathom. In the 12 west we have intersected the lode to the west of the cross-course, 2 ft. wide, composed of spar, mundic, &c.; a very promising lode. The lode in No. 2 winze, sinking below the level, is 4 ft. wide, worth 15l. per fathom., and likely to further improve soon. The lode in the stope in back of this level is worth 7l. per fathom. The engine-shaft is set to sink by nine men, at 25l. 10s.; the lode in it is 4 ft. wide, producing good stones of copper ore.

GWYDYR PARK.—Wm. Smyth, April 14: The lode in Gwydyr, driving east, is about 16 in. wide, composed of spar, mundic, blende, and saving work for lead ore—a very kindly end. In Gwyn Llifion two men are sawing timber for launders, &c., and the others engaged securing the shaft.

HARWOOD.—J. Race, April 9: There is no material alteration in the end of the level east in Scar Head vein; they get good samples of lead ore. The drift and stope in north String are each worth about 8 cwts. of ore per fathom. We have got the turn-room holed through into the old level in Mouncer cross vein, and will now get better forward. We have two men working for ore in Trough vein, and have met with good ore in blasting down the side. They will begin with the stope next week.

HERODSFOOT.—T. Trevillion, April 15: The lode in the 160 north is 2 feet wide, and worth for lead 5 cwts. per fathom. The lode in the 160 south is 18 in. wide, and poor. The lode in the 147 north is 1 ft. wide, and yielding stones of lead, but not to value. The lode in the 147 south is 2 ft. wide, and worth 12 cwts. of lead per fathom. The lode in the 137 south is worth 6 cwts. of lead per fm. The lode in the 127 south is 2 ft. wide, and will produce 20 cwts. of lead per fm. The lode in the 117 south is 1 ft. wide, and worth about 5 cwts. of lead per fm. The stopes throughout the mine continue to yield the usual quantity of lead. We sold on Saturday last 62 tons of lead, to Messrs. Stock and Co., which fetched 26l. 17s. 6d. per ton.

IMPERIAL.—J. Richards, April 14: The lode in the 50 as been cut through; it is 15 ft. wide, composed of gossan, quartz, and mundic, with flookan on the hanging wall, a fine looking lode.

LOVELL CONSOLS.—W. Chappell, April 15: Good progress is being made in sinking the new shaft below adit; in five weeks from the above date we hope to have the shaft sunk sufficiently deep to extend the level east and west on the course of the lode, and, from what has been taken away in the back and bottom of the adit, we may reasonably expect a good run of tin ground, after the ends are driven a little way. The machinery and pitwork are in good order.

MAUDLIN.—J. Tregay, April 11: The men have been principally employed in clearing the leats, to bring home the water to the wheel to facilitate the hauling of the stuff, and in clearing stuff in the deep adit level, so that little progress has been made in driving; we hope to be able to resume the driving by the latter part of next week.

MINERA UNION.—W. T. Harris, April 16: Low's Shaft is now 5 yards below the 40 yard level, and the ground is favourable for progress and yielding stones of lead, but not to value—improving as we go down. The lode in the 40 north is large and very promising, yielding good stones of blende.—Williams's Shaft: The lode in the 40 north is worth 15 cwts. of lead per fathom; the stope in the roof of same level is worth 12 cwts. of lead per fathom.—Brabner's Shaft: The pitch in back of the 60 has improved, and at present is worth 8 cwts. of lead per fathom. The pitch in back of the 80 south is worth 15 cwts. of lead per fathom.

MOUNT PLEASANT.—W. Wasley, April 16: Since my last report I have put the men driving the 120 yard level cross-cut, north of Jenkins's shaft, to drive west, and am glad to say that we have got out of the hard ground I mentioned in my last. I have now set the end to eight men to drive north, at 20s. per yard, the men to pay for drawing the stuff, &c., as usual. I have suspended the driving of the cross-cut, south of the shaft, and put the men in the north cross-cut. I have set the tributers working near Bright's shaft to raise 3 tons of ore, at 8l. per ton. If they get any over 3 tons for the month to be at 4l. per ton. The men to pay 8s. per ton for dressing, and all other costs as usual.

NETHER HEARTH.—Wm. Vipond, April 9: The ore in Harriet's vein continues about as last reported. The High vein is still easy to work, but not producing much ore. We have some signs of an improvement in the ground east in Henry's vein.

NEW BIRCH TOR AND VITIFER CONSOLS.—W. Skewis, R. Trevarthen: There is no change to notice in the 48 east, on north lode, from last report, then worth 4l. per fathom. The skip-road, &c., is completed to the 48 fm. level, and the stuff is now drawn through the new shaft. The shaftmen are now engaged in cutting plat at this level, for the purpose of sinking below it as fast as possible. The lode in the winze sinking below the 48, on main lode, is worth 4l. 10s. per fathom. The pitches are without change to notice.

NEW CROW HILL.—W. Trelease, April 14: It was our measuring and setting-day on Saturday last. The winze below the 70 is 2 fathoms 1 foot, and is re-set for the month to six men and three labourers, at 10l. 10s. per fathom; the water here has a little increased of late, but the ground rather better than it was a week ago; this winze is now down 7 fms. 0 ft. 9 in. below the 70. The stope over the Midway level in the old winze below the 55 measured 8 fms. 2 ft., but the ore here has all been cut out in the past week, though we had a nice lode there only a week ago, and I should try a little further. The 55 east measured 3 fms. 3 ft. 6 in., and is re-set to three men and three boys, for the month, at 3l. per fathom.; the lode here is now 5 ft. wide, made up of spar, flookan, white iron, mundic, jack, &c., but without lead visible to the eye. No. 1 stope, above the 35, measured 4 fms. 0 ft. 2 in., and is re-set to six men, for the month, at 25s. per fathom, and 70s. per ton for ore; the lode here has somewhat improved in the past week, and is worth now in places 10 cwts. of ore per fathom, and seems inclined to further improvement. No. 2 stope measured 4 fms. 3 ft. 4 in., and is re-set to six men, for the month, at 70s. per ton for the ore, though the lode is less valuable this week, worth now in places 40l. per fathom.—Wheal Louisa: The sinking here measured 3 ft. only, as the men have been engaged about other things in the shaft, but I may add the shaft is now in a regular course of sinking by six men and three labourers, at 18l. per fathom, stented 10 fms. below the 60, of which 16 ft. has been sunk. The 60 east has been driven 9 ft. 8 in. in the past month, and is re-set to two men and two boys, for 2 fms., at 5l. per fathom; the lode in this end is now 5 ft. wide, made up of almost all sorts—mundic, jack, peach, white iron, decomposed elvan, red iron, quartz, soft spar, &c., with a little lead, and plenty of water flowing from the lode, and although at present not to value, it is a great, kindly lode. We have now on the mine dressed, and shall sell about the end of the week, about 13½ tons of ore of good quality.

NEW EAST BIRCH TOR AND VITIFER.—William Skewis, April 14: The lode in the 10, east of Prideaux's shaft, is still very large, containing a large quantity of micaceous iron, &c., and good saving work for tin. The pitches continue to yield the usual quantity of tin.

NEW GREAT CONSOLS.—R. Pryor, R. Trathen, April 14: Since our last report we have drained the water a little below the 50, and should the 75 fm. level plunger-pole hold good we hope to have the mine in fork to that level in about a fortnight from this time. Ellis's engine continues to work admirably, and all surface work is going on well.

NEW PEMBROKE.—F. Puckey, J. Puckey, April 13: In the 75 fm. level end, driving west of the engine-shaft, the lode is 3 feet wide, and of great promise, composed of quartz, peach, white iron, and tin, and still worth 18l. per fathom. In the 75 fm. level end, east of the cross-cut, we have intersected a small cross-course, which has disordered the lode; after passing the influence of the cross-course the lode is again opening very regularly, and looking promising in a short distance driving to improve to its former size and value—20l. per fathom. The winze sinking below the 60, east of the cross-cut, is now down 16 fms.; the lode therein has not been taken down during the past month, as we are urging on the sinking of the winze as rapidly as possible to communicate with the 75 fm. level for ventilation, and which we hope to accomplish in a fortnight from this time. The stope in the back of the 60 west is without alteration, still worth 12l. per fathom for tin. In the 45 fm. level cross-cut driving south, west of the first part of the cross-course, we have intersected a lode or branch, which is about 6 in. wide, containing some good quality copper ore, and are now driving west on the course of the same. In the 45 fm. level cross-cut north, west of the

great cross-course, the ground is favourable for progress, and the end is letting out more water; price for driving 50s. per fathom.

NEW TRELEIGH.—S. Michell, April 16: The lode in the bottom of the new shaft has a good appearance, and seems to be opening as we sink; there is a solid leader of ore through the shaft, and appears to be best towards the western end, inclining in the direction of the ore gone down in the 70. I think the ground is a little more favourable for sinking. The progress in the rising above the 70 is satisfactory, already up over 4 fms., with a promising lode, and when communication to the 60 is completed we shall, I hope, be in a position to raise more ore. There is no change at Nicholson's for the week. I deferred writing until this morning, as I wished to see the lode in the shaft up to the latest before sending away the report.

NEW WHEAL TOWAN.—R. Pryor, April 15: The lode in the adit level, driving west, is 1 ft. wide, composed of mundic, peach, spar, and stones of copper ore. I set the end again on Thursday last, to four men, at 6*l*. per fathom, and no time will be lost in communicating it to the deep adit cross-cut, but in consequence of the air being so dead it has a little impeded the progress of driving.

NORTH DOWNS.—F. Pryor, John Grenfell, April 14: In the 60 west the lode has not been taken down this week, consequently it is of the same value as last reported—20*l*. per fathom. Two stopes in the back of this level are each worth 10*l*. per fathom. The 50 west is producing a little ore, but not to value. The winze sinking below this level is worth 8*l*. per fathom. A stope in the back of this level is also worth 8*l*. per fathom. The rise in the back of this level has improved, worth 6*l*. per fathom. The 50, west from point of horse, is worth 12*l*. per fathom. No change to notice in any other part. Our ore sold on Thursday last weighed off 127½ tons, realising 1009*l*. 3s. 9d.

NORTH POOL.—J. Vivian and Son, F. Clymo, April 16: Main Lode: In the 40, west of sump, the lode is improving, and yielding copper ore of good quality throughout, and the appearances altogether favour the expectation of an early and much greater improvement. The stopes in the back of this level are yielding 1½ ton of very good yellow copper ore per fathom. We hope soon to get 20 tons of ore ready for sale.—Ballarat Lode: In the 40, west of Ballarat shaft, the lode is improving in character, the quartz, which forms the principal ingredient, becoming more friable, and congenial as a matrix for copper; it is also spotted with yellow copper ore.

NORTH RETALLACK.—G. R. Odgers, J. Harris, April 15: The lode in the adit level north, on the No. 2 lode, is from 15 in. to 18 in. wide, composed of quartz, gossan, &c.

OKEL TOR.—J. Rodda: There is no change in the 80 east, on south lode, except that the ground is a little easier for driving. The part of the lode being carried in the 65, east of Hele's winze, is producing good stones of ore. We shall cut through the lode after driving about 3 fms. further east. The lode in the 65 west has a good appearance, and will produce 4 tons of ore per fathom. The winze sinking below this level is down about 4 fms., and the lode has yielded for the length of this winze (over 12 ft.) 11 tons per fathom; and in the present bottom the lode is equally productive, and looks favourable for the 80 fm. level. The three stopes in the back of this level will produce respectively 5, 4, and 3 tons of ore per fathom. The end driving west of the footway winze, on the north lode, in the back of the 65, is holed through to Wilton's old pitch. We have opened a profitable piece of ground here, and the men will be put to stope it forthwith. The stope in the back of the 80, west of Reynolds's winze, will yield 2½ tons of ore per fathom. We have commenced to cross-cut south at the 65, to cut the intermediate and south lodes about 50 fms. west of Hele's winze, which is an object of great importance both for making discoveries of ore and for ventilation. The stopes in the 50 are without alteration. We have sampled 260 tons of ore for February and March.

OLD GUNNISLAKE.—H. Rickard, April 15: Michael's shaftmen are engaged in casing and dividing the shaft below the 81 to the 91 fathom level, taking out penthouse, &c., in order to bring the kibbles to the bottom to clear the 91, which will be completed in a day or two. The clearing and securing the 81 west is progressing well on the green, or south lode, opening up good tribute ground as far as seen. We have been into the end of the 71, but the the air is so bad we cannot work until a winze from the 71 to the 81 is cleared, which (being choked at present) the men are now engaged in doing. I hope that within a week or 10 days we shall be in a position to set several tribute pitches, the ore being of good quality. In order to give better ventilation, the 61, on the middle lode, is already cleared, and the tramroad laid down 40 fathoms towards Susan's shaft; the whole distance being only 90 fathoms, ought to be pushed on with a full pare of men as rapidly as possible, so that the mine might be ventilated before the summer arrives. The engine is working well.

OLD WESTMINSTER.—A. Ede, April 15: There is no change to notice in the 92 fm. level; the lode continues very strong, and letting out a great quantity of water. Also the pitch in the back is as last reported, producing from 12 cwts. to 15 cwts. of lead ore per fm. The lode in the Bramnock sump, in the bottom of the 65 fm. level, is worth 25 cwts. of lead ore per fm. The lode in the pitch east of No. 1 sump is producing 1 ton of lead ore per fm. No. 4 sump is sinking by six men; we expect to get into the ore ground in from 4 to 5 fms. sinking. There is no change to notice in any of the other pitches.

PEDN-AN-DREA UNITED.—W. Tregay, J. Thomas, E. Chegwin, April 11: Sump: In the 140 west end the lode is worth 12*l*. per fm., and promises improvement. In the 130 east the lode is not so good, worth 10*l*. per fm. In the 130 west the lode is worth 6*l*. per fm. In the 120 west the lode is worth 25*l*. per fm., and promises further improvement. In the 100 east rise the lode is worth 12*l*. per fathom.—Cobbler's: The lode in the bottom of this shaft, sinking below the 120, produces stones of tin, and is promising for improvement. In the 110 east no more lode yet intersected, ground favourable for cross-cutting. In the 110 west the lode is worth 12*l*. per fm. No other change to report.

PENHALE UNITED.—R. Pryor, H. Bennett, J. Pryor, April 14: Phillips's Engine-shaft: The men in this shaft are still making good progress, and we hope to reach the 80 fm. level by the end of this week; when attained, no time will be lost in draining the mine to the bottom (90), which is being pushed on with all possible speed.—Morcom's Shaft: In this shaft the men are getting on well with the casing and dividing, putting in footway, and making the same complete below the 30 fm. level. The tributers are busily at work breaking lead, and we have during the past week drawn to surface a good pile of silver-lead. The machinery is in good condition, and working well, and all surface operations are progressing satisfactorily.

PENHALE WHEAL VOR.—W. H. Martin, April 15: Hollingsworth's engine-shaft is sunk 10 fms. below the 74; the men are engaged cutting plat at the 84, and easing and dividing shaft preparatory to sinking below that level.—Penhale North Lode: The lode in the 60, west of Holroyd's shaft is 1 ft. wide, of peach, prian, quartz, and with tin disseminated throughout. The lode in the last taking down in the winze sinking below the 50 west has not been found to be so productive for tin, owing to a floor of spar met with in sinking. In Little Benjamin's shaft, sinking below the 40, the lode is 6 in. wide, saving work for the stamps, we have had capital speed in sinking this part. The tributers are working very well.

PENHALLS.—S. Bennetts, Wm. Higgins, April 11: In the 60 east the lode is found to be thrown up just over the back of the end, we have, therefore, commenced a cross-cut north to meet with it beyond the gossan. In the 60, west of cross-course, nothing has been met with north or south as yet. There has been but little of the new lode taken up in the 50 west since setting-day; the rises above this level are without change; the same remark applies to the 44 east, on the Pink lode. The whim-engine house is completed, and the engine is being erected with all speed, so as to be ready for working by the end of the present month. We are hoping to be able to sufficiently clear the eastern adit as to take up the Wheal Betsy water in the course of a fortnight, when we shall immediately recommence forking the water from the old Pink Mine.

PRINCE OF WALES.—J. Hitchins, J. Gifford, W. Gifford, April 15: In the 65, in the bottom level west, the lode is not well defined, and small, there being but a very little stone in it that it is scarcely free of the run of capels through which the cross-cut from the shaft was driven. This level has been extended east about 2 fms. In the end the lode is about 18 in. wide, assuming a more regular appearance, and producing good stones of ore, although at present of no value, yet likely to improve, and the water is a little on the increase. The 55 fm. level west is daily expected to intersect the western cross-course; the lode here is 2 ft. wide, worth 18*l*. per fm., although the influence of the cross-course has lately, to some extent, disordered it. In the 55 east the lode, so far as taken down, is fully 6 ft. wide, and no north wall reached; at present the end is more mixed up with capels, still worth 40*l*. per fathom, and we have now commenced to rise against the winze below the 45, in which there remain 2 fms. to form the communication, which we could not effect by sinking, on account of the abundance of water. The 45 west is driving on a lode about 3 ft. wide, very kindly, and producing ore and mundic, but hardly enough to value; this level east is still driving by the side of the lode, which we shall cut into soon. The stopes throughout the mine are, on the average, of the same value as when last reported on. We are in a forward state with our preparations for sinking the eastern shaft, and shall be ready to begin in earnest in the early part of next week. Other operations as usual, in regular course of working.

PRINCESS OF WALES.—G. Rickard, April 16: The ground in the north adit level cross-cut, driving towards Prince of Wales main lode, remains much the same, and the men are making good progress. Little has been done during the past week in sinking the trial shaft on the above-named lode, in consequence of the men being engaged in raising stone for powder-house, &c. The lode here is over 5 feet wide, showing fine spots of black and yellow copper ore, presenting every indication for a valuable mine in depth.

PROSPER UNITED.—J. Nicholls, J. Hall, W. Glanville, April 15: The 100 east is producing saving work for tin and copper. The 100 west is unproductive. The stope in back of the 100 is worth 10*l*. per fathom. The winze in bottom of the 90 is worth 10*l*. per fathom. The 80 west is producing saving work for tin. The 80 fm. level stope is worth 5*l*. per fathom. The 70 east, on Gwallon lode, is producing occasional stones of ore. The stopes in back of the 70, east of Hosking's, are worth 8*l*. per fathom. The branch in the 60 west is producing occasional stones of ore. The lode in the 50 west is worth 4*l*. per fathom for tin. The stopes in back of this level are worth about 6*l*. per fathom. The 50 east is producing occasional stones of ore. The 40 west is worth 5*l*. per fathom. The 25 east is worth about 5*l*. per fathom. The stopes in back of this level are worth 4*l*. per fathom. No other alteration to remark on.

REDMOOR.—T. Taylor, April 16: We have cleared about 10 fathoms through the run under the tin lode, and the stuff will produce about ⅙ cwt. of tin to the ton; it contains a deal of mundic, and good stones of black copper ore. I do not think much of the backs are worked away, only run in, the ground being soft. No change in the cross-cut south in the 64 fm. level.

ROARING WATER.—Henry Thomas, April 14: Last Saturday being setting and pay-day, Gilliman's engine-shaft is set to nine men at the former price—15*l*. per fm. for the month; sunk last month 2 fms. 1 ft. 4 in., making the total depth 47 fms. 1 ft. 4 in.; the rock in the shaft has again taken a southerly dip about 10 or 12 in. in a fathom near the bottom of the shaft. A large stream of water is issuing from the north side which is probably proceeding from Grady's lode. The men are working satisfactorily, and earning fair wages.

ROSECLIFF AND TOLCARNE.—R. Pryor, T. Gundry, April 15: We set the following bargains on Saturday last:—The 50 to drive east of the cross-cut, on No. 3 lode, by six men, at 4*l*. per fathom; we have not as yet intersected the lode in this end east of the great cross-course, but judging from the character of the ground, with the influx of water coming therefrom, we should think we were near the same. This end is being pushed on with all speed in order to reach the lode. The 50 to drive east of the cross-cut, on No. 4 lode, by two men, at 4*l*. per fathom; the lode in this end is 18 in. wide, composed of mundic, prian, flookan, and spots of lead intermixed. The winze to sink below the 30, on No. 4 lode, by six men, at 5*l*. per fathom; the lode is 2 feet wide, producing good stones of lead, and presenting a good appearance. Our pay and setting passed off very satisfactorily.

ROSEWARNE CONSOLS.—J. Nancarrow, R. Knuckey, April 11: At our survey to-day the following work was set:—The 70 to drive south-east on the caunter, at 7*l*. per fm.; the lode is worth 4*l*. per fm. Sarah's shaft to sink below the 30, by six men; the lode yields ore to save. The 20 to drive west, by four men, at 2*l*. 10s. per fm.; here the lode looks very encouraging, and the part recently driven through has yielded some good ore. We have also set one pitch on the caunter, below the 30, at 12s. in 1*l*., and the ground will soon be drained so as to enable us to set other pitches below the 30. There are three other pitches on copper, and one on tin, at tributes varying from 13s. 4d. to 15s. in 1*l*. Our prospects for copper are more encouraging.

SNAEFELL.—W. Kitto, April 6: Since the general meeting no change of any importance has taken place in the mine. The engine-shaft is now sunk deep enough for a "trip lodge" at the 60, which with penthouse, &c., will be completed in a few days, and the sinking continued as usual with the greatest force we can bring to bear on it. The lode in each of the 60 fm. level ends is large and promising, although by no means rich; we can only carry part of it in the ends, and have, therefore, to make small cross-cuts occasionally to see its size and character. In the 40 end north we are still getting nice bits of "steel lead," but I fear we are too shallow for much riches. I see nothing whatever in any other part of the mine to cause the least remark.

SORTRIDGE CONSOLS.—R. Jackson, April 16: Hitchins's engine-shaft is down 6 fms. below the 140 fm. level; the ground is favourable for sinking, and good progress has been made. In the 140 fm. level, east of the engine-shaft, the lode is 2½ ft. wide, composed of spar, prian, mundic, and good stones of copper ore, and looking very promising.

SOUTH CONDURROW.—J. Vivian and Son, W. Williams, April 11: King's shaft is now 4 fms. below the 82 fm. level, and the main part of the lode still standing to the south. In the 82 east and west there is no alteration worthy of notice; the same remark applies to the 71 east and west. In the 61 north, on the cross-course, east of King's shaft, the middle lode has not yet been intersected. In the 61, west of King's shaft, the lode is producing tin, worth about 5*l*. per fathom. In the tin stope in back of the last-named level the tinstone continues of the same quality. In the 51, east of Old Tye shaft, we are still driving by the side of the lode. In the 51, west of Vivian's shaft, the lode is of the same size and of as highly favourable a character for copper as when last reported. The rise in the back of the last-named level, east of Vivian's shaft is producing copper ore worth about 7*l*. per fathom. The steam-whim house is fast rising.

SOUTH DARREN.—J Boundy, Wm. H. Boundy, April 9: The lode in the 70 west is 20 in. wide, composed of good mineralised killas, copper, and spots of lead ore, and from its appearance we anticipate an early improvement. The lode in the 60 west is 3 ft. wide, containing good copper and lead ore; present value 30*l*. per fathom, and its appearance indicates further improvement. Good ore ground has been passed through at this point about 28 fms. in length, which has been valued at from 10*l*. to 30*l*. per fathom for lead and copper ore; and, judging from present appearances (that is, from the ore ground which has been passed through and gone down in the bottom of the 60), the 70 will, in our opinion, lay open a valuable piece of ore ground. This level (the 70) is being pushed on by six men as fast as the nature of the ground will admit of. The 58 west has recently passed through another cross-course, which has disordered the lode, and at present is poor; however, we are glad to say we are getting into a better stratum of ground, with more water issuing from the end, and presenting indications which promise improvement. Here we wish to remark that we passed through the same cross-courses in the levels above. The length of ore ground passed through at this point, west of the disordered ground alluded to in the report for the last general meeting, is about 12 fms., which has been valued at from 13*l*. to 18*l*. per fathom. In the 30 fm. level cross-cut south-west, in search of more lode, nothing has been met with to value; this we shall suspend shortly, and put the men to open on a branch going off in a northerly direction. In the shallow level driving east the lode is about 15 in. wide, composed of blue killas, sulphur, spots of copper, carbonate of lime, and presenting a better appearance than we have noticed for some time past. The stopes throughout the mine are looking just the same, and continue to yield their usual quantity of ore. We sampled yesterday (Wednesday) 35 tons of silver-lead ore. We shall now get ready from 40 to 45 tons of copper ore as soon as possible.

SOUTH HERODSFOOT.—W. Goldsworthy, April 15: The engine-shaft is in regular course of sinking below the 86 fm. level. There is no particular change to notice in the ground since my last report.

SOUTH WHEAL GRENVILLE.—G. R. Odgers, W. Bennetts, April 11: The lode in the engine-shaft, sinking below the 30, is from 1 ft. to 15 in. wide, composed principally of quartz. We are forcing down this shaft with all speed.

ST. JUST AMALGAMATED.—R. Pryor, W. White, R. Wearne, April 15: Eastern Mine: There is no change to notice in this part of the mine since our last report.—Western Mine, Saveall's Lode: The shaftmen have not yet completed their bargain, but are making good progress; the lode in the shaft is worth 12*l*. per fathom. The lode in the 100, east of shaft, is worth 6*l*. per fm. The lode in the 90, east of shaft, is worth 5*l*. per fathom, and improving. In this level, west of shaft, the lode is much the same as when last reported on. The lode in the 76 west is worth 7*l*. per fathom. In the winze sinking below the 62 the lode is worth 6*l*. per fathom.—Owl Lode: The lode in the 40, north of Reddipper shaft, is worth 6*l*. per fathom. The lode in the 20 north 9*l*. per fathom. The lode in the 10 north has improved, and now worth 10*l*. per fm. The lode in the 20, south of Saveall's, is worth 4*l*. per fathom. There is no change worthy of notice taken place in any other bargain, and we are glad to say, on the whole, the mine has improved.

SUMMER HILL.—W. Wasley, April 16: We continue to make fair progress with driving the south-west level, the flat in the end of which is looking very promising, but is not producing any ore at present. I have to-day suspended the driving of the cross-cut from the ore course, as I think we are not far enough to prove the ground in that direction. I have put the men to drive on a branch by the mouth of the above cross-cut. The ground or flat in the level driving east of the cross-cut, north of Hale's shaft, is without any alteration to notice since last reported on.

VIGRA AND CLOGAU.—W. J. Holman, April 16: The lode in the bottom of No. 5 shaft, under No. 2 adit west (No. 2 mine), is 5 feet wide, and well mineralised, and good progress is being made in sinking. The lode in the drivage east from No. 4 shaft is at present rather small, but looks well. In the stopes, from same shaft, the lode is 4½ ft. wide, and is producing good stamping stuff. From the bottom of stope under No. 2 level, east of No. 4 shaft, a little visible gold has been broken. The cross-cut south of No. 1 level, and the drivage east from No. 1 shaft, are the same as last reported. The Jenny's adit at Vigra Mine is in dead rock. At the old Clogau Copper Mine the work is going on well. The short supply of water at the reduction works has prevented us from working the stamps for the week.

WEST BASSET.—G. Lightly, April 15: In the 154 fathom level, east of Grenville's shaft, the lode is 4 ft. wide, containing stones of ore. In the 144 east the lode is yielding 2 tons of ore per fm. In the 144 west the lode is yielding 2 tons of ore per fm. In the 75 east, on the middle lode, the lode is yielding 1 ton of ore per fm. There has been no alteration in the past week in the value and character of the lodes at the other points of operation.

WEST BRITON.—W. Rosewarne, April 16: Wheal Strawberry Lode: The lode in the 42 fm. level, west of the cross-cut, is 2½ ft. wide, composed of mundic, quartz, and a little copper ore—a very kindly lode, which will doubtless improve as we get nearer the elvan course. We shall push on this level west as fast as possible, so as to get the water drained down in the western part of the mine, when we shall be able to set a good many tribute pitches. We are clearing up a winze about 15 fms. east of our cross-cut on this lode, which was sunk as deep as the former workers could get with the water in the 20 fm. level, and to-day have broken some splendid stones of yellow copper ore from it; this winze is quite dry, being drained by the 42 fm. level. The lode in the winze sinking below the adit, in Wheal Goosebery, is 1½ ft. wide, producing a little copper ore.—Dumpling Lode: The lode in the 42 fm. level, east of the engine-shaft, is 4 ft. wide, containing some good stones of copper ore, and is improving as we extend east on it. The tribute pitches are without change to notice.

WEST GODOLPHIN.—Joseph Vivian and Son, J. Pope, jun., April 16: Hope Lode: The water has so far drained off that we are able to drive the 25 fm. level east and west of Paull's shaft without let or hindrance, and have pleasure in saying that the lode is increasing in size and productiveness, so that there is every encouragement afforded for the anticipation which we have entertained of meeting with the continuation at this and deeper levels of the valuable formation of tin which we have already discovered in the levels above. In the 15, east of Paull's shaft, the lode is improving, being now worth 5*l*. per fathom. The 8 fm. level is opening through tin ground of a profitable character. The stopes in the backs are leaving a good profit.—Caunter Lode: In the deep adit level, south-east of Charley's shaft, we have driven 6 feet east to prove whether or not there might be a part of the lode in that direction, and having found none, we shall now resume driving on the course of the lode, which is large, and producing a little tin. The tribute pitches in the back of the deep adit, which are let at low tributes, are turning out well. We shall as quickly as possible get the hydraulic engine fixed between the shallow and deep adits, by which we shall be able to develope to a considerable depth the valuable run of tin ground discovered at the deep and shallow adits.

WEST PRINCE OF WALES.—W. C. Cock, April 14: We have done nothing to the lodes in either of the shafts during the past week, having been chiefly engaged in putting in timber and doing other work, and have, therefore, no change to notice. The erection of the drawing-machine is in progress, and will be proceeded with as fast as possible.

WEST TOLGUS.—April 15: We think the south wall of the lode is cut in the 95 fm. level; the lode is fully 7 ft. wide, and will produce 8 tons of ore per fm., worth 36*l*. to 40*l*. per fm.—a good lode; this is to the east of the cross-course. We have not cut through the cross-course yet, and cannot say anything about its size or value. West of cross-course, before we can do any more in the 95 fm. level we have to take out penthouse, case and divide shaft from the 85 to the 95 fm. level, and to fix skip-road, which will be done as fast as possible. The lode in the 85 fm. level west is 3 ft. wide, consisting of spar, white iron, and stones of ore—a very promising lode. In the 85 fm. level east the lode is 5 ft. wide, worth 6*l*. per fm. We have five stopes over the back of the 85 fm, level, working by thirty men, worth on an average about 15*l*. per fm.; one of these stopes is not looking so well as when last reported. In the 75 fm. level west the lode is 3 ft. wide, consisting of spar, producing occasional stones of ore—a kindly lode, letting out a quantity of water. In the rise over the back of the 75 west the men are rising by the side of the lode; we calculate on holing it to the 65 fm. level this week. The stope over the back of the 76 is worth 15*l*. per fm. The lode in the 65 east is 1 ft. wide, worth 5*l*. per fm.; the lode is smaller in this level than we have ever seen it; the present end is almost dry; price for driving, 16*l*. per fm. In the 50 fm. level west the lode is 2 ft. wide, producing stones of ore, and letting out more water than usual. The men are progressing favourably in sinking Richards's shaft.

WEST WHEAL TREMAYNE.—S. Roberts, April 14: We are making all speed possible with our engine-shaft. The men have cut the ground, fixed lift, and sunk 6 feet. We intend pushing on as fast as possible.

WHEAL AGAR.—E. Rogers, April 15: The only change to notice since my last report is in the 150 end, where the lode is larger, now 3½ ft. wide, all saving work for tin.

WHEAL BULLER.—F. Pryor, J. Brown, April 15: Stevens's Shaft: The 92 east, on the south part of the lode, is worth for tin 25*l*. per fathom. The 80 fm. level east is unproductive. The stope under this level is worth 8*l*. per fathom. No. 1 stope, in back of this level, is worth 9*l*. per fm. No. 2 stope is worth 22*l*. per fathom. The stope in the bottom of this level, west of the shaft, is worth 23*l*. per fm. The 80, east of Hocking's cross-course, is producing stones of tin. The 70, west of this cross-course, is worth 6*l*. per fm. The winze sinking under this level is producing tin, but not to value. The stope under the 60, west of Knuckey's winze, is worth 12*l*. per fathom. The stope east of this winze is worth 13*l*. per fm. In the 50, east of the cross-course, on the north copper branch, the lode is worth 7*l*. per fm. for copper ore. The stope in the back of this level is worth 9*l*. per fm. for copper ore. In the 50, west of Bartle's cross-cut, the lode is worth 8*l*. per fm. No other change in the mine to notice.

WHEAL CREBOR.—J. Gifford, April 15: In the 120 fm. level west, driving by the side and under the lode, the ground is favourable for progress, and well mineralised, with occasional stones of ore in it. In the 120 east we have cut through the eastern cross-course, but as yet have not seen the lode to the east of it; we hope to be able to report thereon next week. In the 96 cross-cut south there is no change to notice, and the tribute pitches are yielding an average quantity of ore, so that we shall sample about 70 tons of ore by the end of the month. The machinery is all in good condition, and working well.

WHEAL FRIENDSHIP.—April 13: Bennett's Lode: The lode in the 170, west of the flookan cross-course, has not been taken down since last report. The lode in the winze sinking below the 150 is from 2½ to 3 ft. wide, producing a little ore, but not enough to value. The lode in the 150, west of Whitburne's cross-cut, is 2½ ft. wide, composed of spar, peach, and mundic, with lead and copper ore, together worth 5*l*. per fm.; and, judging from the present character of the lode, we think there are fair chances to expect greater improvement shortly. The stope in back of the 150 fm. level will turn out 1 ton of ore per fathom. The stope in bottom of the 140 will yield 1 ton of ore per fathom. The stopes in the bottom of the 88, east of the flockan cross-course, will yield about 1 ton of ore per fathom.—Main Lode: The stopes in bottom of the 70 fm. level will yield 1 ton of ore per fm., and two stopes in back of this level will yield 1½ ton of ore per fathom each. The lode in the winze sinking under the 40 is 2½ ft. wide, and will produce about 1 ton of ore per fathom.—Glebe: In the 80 fm. level cross-cut, driving south from Curtis's shaft, we have intersected a branch 8 in. wide, producing good stones of rich quality ore, but have not yet sufficiently opened on it to ascertain its value.

WHEAL GRENVILLE.—G. R. Odgers, Wm. Bennetts, April 11: The lode in the 130 west is 2 ft. wide, composed of gossan, and yielding a little tin, but not to value. In the 120 west, from all appearance, we have discovered another lode on the south side; we have cut into 2 feet, and no south wall; as fas as seen it produces rich tinstone, worth fully 12*l*. per fathom. Should this prove to be another lode, as we think it really will, we can easily intersect it at the upper levels by short cross-cuts. The lode in the 100 west is 3½ ft. wide, and worth from the last assay fully 15*l*. per fathom. The lode in the 90 west is 20 in. wide, producing good work for tin, worth 10*l*. per fathom. The lode in the 80 west is fully 3 ft. wide, and worth fully 12*l*. per fathom. The mine, on the whole, is looking very promising.

— G. R. Odgers, W. Bennets, April 16: We have no particular change to notice in this mine since our last advice. The men in the 120 fathom level west have been engaged clearing their stuff, and from the 100 west we are breaking some good tin.

WHEAL KITTY (Uny Lelant).—Wm. Rosewarne, April 16: South Russoe Lode: The lode in the 40, east of the shaft, is worth 5*l*. per fathom. The lode in the 40, west of the shaft, is worth 4*l*. per fathom. The lode in the 40, west of the winze, is worth 4*l*. per fathom. The lode in the rise in the 30 east is worth 5*l*. per fathom.—North Russoe Lode: The lode in the 150, east of Bolitho's, is worth 4*l*. per fathom. The lode in Bolitho's winze, sinking below the 150, is worth for the length of the winze (9 ft.) 6*l*. per fathom. The lode in No. 4 winze, sinking below the 140, east of Bolitho's, is worth 4*l*. per fathom. The lode in the 110, west of Bolitho's, is worth 3*l*. per fathom. The lode in the 110, east of Bolitho's, is producing a little tin.—North Gowan Lode: The lode in Bolitho's shaft, sinking below the 15, is producing a little tin. The lode in the 50, west of Rogers's shaft, is unproductive. The lode in the rise in the back of the 50, west of Rogers's shaft, is worth 35*l*. per fathom. The other bargains are without change.

WHEAL KITTY.—W. Polkinghorne, S. Davey, April 11: In the 82 fm. level, driving west of Holgate's shaft, the lode is 2 ft. wide, and yielding good saving work for tin.—New Shaft, Pryor's Lode: In the 94 fm. level cross-cut, driving south, no change has taken place during the week. In the 82 fm. level, driving east of shaft, the lode is looking more promising, and worth for tin 7*l*. per fm. In the 82 fm. level, driving west of shaft, the lode is worth for tin 16*l*. per fm. In the 65 fm. level, driving west of shaft, the lode is worth for tin 6*l*. per fm. In the 44 fm. level, driving east of shaft, the lode is producing stones of tin.—Caunter Lode: In the 82 fm. level, driving north of Pryor's, the lode is 1 foot wide, and yields a little tin.—Vottle Lode: In the 24 fm. level, driving east of cross-cut, the lode is 2 ft. wide, and worth for tin 5*l*. per fm.

WHEAL MARY FLORENCE.—W. Verran, W. Johns, April 15: In sinking Saw's shaft below the 15 we find the ground to be somewhat improving, and there is a prospect of soon having killas to sink through instead of capel and spar, when we hope to make greater progress in deepening the shaft for another level. In driving west at the 15, on the copper lode, we are glad to be able to report a considerable improvement. In cross-cutting the lode we find it about 6 ft. wide, with two splendid walls, and the underlie about 15 in. to the fathom, composed of capel, quartz, peach, mundic, and copper ore—a very fine-looking lode, producing good quantities of ore and mundic, and likely to be still more productive as we get nearer the lead lode, as well as beyond it, as we get under the ore ground driven over in the deep adit, which is 15 fms. shallower. On the whole, we consider the prospect of opening up a really valuable mine to be brighter than at any former period.

WHEAL SPARNON.—W. Tregay, April 11: In the 15 east the lode produces stones of tin, and is a kindly looking lode for improvement. In the 15 west the lode produces good stones of copper ore: this level is exactly on the top of the elvan, a favourable point for the production of copper ore, and the lode in the end is very promising for improvement.

WHEAL TRELAWNY.—W. Johns, J. Pryor, April 15: In the 220 fm. level cross-cut east, at the bottom of Trelawny's engine-shaft, we are making good progress towards the lode; in the extreme end we have cut a branch, which is letting out water freely; taking this into consideration with the character of the ground, we fully expect to see an improvement in the lode from the level above. In the 210, south of shaft, we have not taken down the lode since last reported, but the ground seems to be easing; this augurs well to improve the lode. In the same level, north of shaft, we are still cutting into the lode, which is so far producing very fine stones of ore, a very kindly lode, but up to this date we have not drained the level above.—Smith's Engine-shaft: Since our last report we have been driving the 210 south, the 210 north, as well as sinking a winze in the bottom of the 196 north by the side of the lode; we shall continue this course another week before taking down the lode. The 196, north of Chippindale's shaft, is improved, worth 5*l*. per fathom. We are busily engaged in dressing for another parcel, and, no doubt, we shall sample our usual quantity. We sold on the 4th inst. 72 tons (computed) of silver-lead ore to Messrs. the Trustees of the Treffry Estate, at 24*l*. 12s. 6d. per ton. We are pleased with the appearance of the mine.

WHEAL UNY.—S. Coade, M. Rogers, April 11: The men are engaged in driving through the south part of the lode, before driving the levels at the 140 fm. level; we shall commence driving east and west of shaft next week. The 130, east of engine-shaft, is worth 16*l*. per fathom. The 120, east of engine-shaft, is worth 12*l*. per fathom. The 110, east of engine-shaft, is worth 8*l*. per fathom. The 100, east of engine-shaft, is worth 9*l*. per fathom. The 120, west of incline shaft, is worth 10*l*. per fathom.

FOREIGN MINES.

CAPULA.—Capt. Paull, March 8: We have sent to Mexico by the last two conductas 583 marcs (4664 ozs.) of silver, the produce of 138½ cargas of metal, beneficiated in the patio, and 27 cargas of metal and polvillos smelted at San Cayetano hacienda, the nett proceeds amounting to $4390·86 (978*l*. 3s. 7d.) There is another torta in beneficio of 132 cargas, the assay from which will be made next week. We have sent in 32 cargas for another torta, which, if the men work, we shall make up to 100 cargas next week. The weekly extraction is put in the memorias according to the quantity dressed. The barreteros generally part the ore on Saturdays, which is dressed during the following week with what remains in the attle; the small is concentrated.—Mine: In the stopes west of San Jorge rise the lode is 1 vara wide, of good azogue ore, but not so much smelting as it had at the back of the level to the east of the rise; the branch of ore is narrow, and the ground very hard. The stopes to the east and west of La Bomba shaft, under the two levels—Angelita and Enriquita—are without alteration. We have also commenced a stope with good azogue ore, east of the shaft, above Enriquita level. All the stopes are now worked on contract, the barreteros receiving the eighth part of the metal. When on day work—that is, rayados—they lose a great deal of time in breaking and picking over the metal after they have blasted a hole by tutwork or contract. I expect we shall double the extraction. We have resumed the driving of the Esperanza and San Enrique levels; in the former we are driving on the north wall; the lode is very promising, producing some good azogue ore; in the latter the lode is composed of very hard white quartz, with spots of ore. The gossan part appears to be wearing out. I like very much the appearance of the lode in the end, and continue in daily expectation that a great improvement will take place. The part of the lode which has been taken down from the south side of San Enrique level (on the west side of the cross-cut south) produces gossan ore from 6 to 12 marcs per monton, as it is a class of ore well adapted for the patio; from 9 to 10 marcs will pay well for reducing; we shall send in a small torta—say 5 montons—for a trial. The cylinder-bed and frame are fixed; we are only waiting for iron from Encarnacion for the holding-down bolts, to screw down the frame, and also the plate for the bearings of the fly and crown wheels. I have sent several letters to the ironworks, but cannot get an answer. I hope to get two barrels going in a short time, to beneficiate 10 cargas daily, to be moved by the small wheel that was erected for a blast, and put up two or more arrastres to grind the sierras until the stamps are in order.

WEST CANADA.—Capt. Plummer, March 17: We enclose the setting list for March. The amount dressed in February was not so much as we expected, the weather throughout was more severe than I have ever before seen it; and, indeed, it continues so yet. Altogether this has been a very strong winter, and has not only prevented us doing the usual amount of surface work, but has added greatly to our expenses to keep the railroads clear of snow. I see no change worthy of notice since our former report. We have completed the pit-work at Bray's, and have commenced to drive the 60, with four men, in each direction; the lode cannot be reckoned of any value, although it is large and promising. The lode in the winze below the 50 yields 1½ to 2 tons to the fathom; the lode is large, and we are only carrying a part of it in the winze. The 30, east of Bray's, is improved, and is now worth 2 tons per fathom. The 40, west of Crase's, looks better, and carries more ore, but does not yield sufficient to pay the cost of working it.—Taylor's Shaft: The 12, going east, is the same as report; it yields about 1½ ton per fathom. The level west has been poor; the lode became divided by a horse, but there are indications of a change occurring for the better. The lode in Trial's shaft is poorer than for some time before, and from its appearance it is likely to remain poor for some time to come. I may mention that the air became so bad at Taylor's that we found it impossible to go on without some means of supplying it artificially. We had a small engine and boiler, fan-blast, and everything complete, which we removed from Bruce's to Taylor's at a trifling expense, and we are now going on famously.

Lovell, Prince of Wales, Herodsfoot, and Tincroft I consider safe investments to give 12½ to 15 per cent. per annum, while the following mines afford a fair opportunity for legitimate speculation, with a view to a good rise in price—Wheal Trelawny, Wheal Emily Henrietta, West Great Work, West Wheal Kitty, New Wheal Lovell, Great Retallack, Caldbeck Fells, Okel Tor, Frank Mills, West Drake Walls, Chiverton Valley, and North Wheal Chiverton. The whole of the above, at their respective current prices, are well deserving of attention. Any change that may take place in the market must necessarily be for the better. DON PEDRO and PESTARENA are the most productive gold mines in the market at present, while CHONTALES, ANGLO-BRAZILIAN, and ROSSA GRANDE will probably attain a more favourable position ere long.

Projected New Companies.

Company.	Capital.	Shares.	Each.
Calcutta Metropolitan Railway	£1,500,000	75,000	£20
Stanley Coal	10,000	1,000	10
Kilmorey Lead Mining	10,000	2,000	5
British Alliance Assurance Corporation	100,000	100,000	1
United Land	250,000	50,000	5
Burnley Land, Building, and Loan	5,000	500	10
Self-Acting Sewing Machine	21,000	4,200	5
Indo-European Telegraph	450,000	18,000	25

STANLEY COAL COMPANY, 10,000*l.*, in 1000 shares of 10*l.* each.—The objects for which this company is established are the purchasing the fee simple and inheritance, or otherwise becoming possessed of or entitled to the beneficial interest of and in the Blakecup Estate, consisting of dwelling-houses, buildings, and land, situate in the township of Liversedge, Birstall, in the West Riding of York, and of the beds of coal thereunder, conveyed to Mr. William Parkin, of Hightown, in Liversedge aforesaid, by indenture bearing date June 1, 1867, &c.; the acquisition, by purchase or otherwise, of lands, buildings, freehold, copyhold, or leasehold tenure, and of beds and mines of coal, ironstone, and other minerals, metals, fossils, stone, earths, and substances whatsoever at various places in the townships of Liversedge, Clickheaton, and Gomersal, or some or one of them, in the parish of Birstall and elsewhere; the acquisition in any manner of any railways, tramways, and other ways, wharfs, staithes, and other works and conveniences, lands, buildings, mining, and other easements, rights, powers, and privileges, and which the company from time to time may think it expedient to acquire; the finding, winning, working, making merchantable, dealing in, selling, and disposing of coal, ores, and other products of mining; the carrying on the business of a coal and coke owner, and a mine owner, and a dealer in and manufacturer of coals, ironstone, and other ores, and refuse of coal and ores, and other products of ores, in all its branches; the acquisition of the goodwill of, or any interest in, any business similar in character to any business carried on by the company; the effecting of any amalgamation of the company and any other companies of similar business; the establishing and regulating, in the United Kingdom and elsewhere, of agencies for any purposes of the company, &c. The Memorandum is signed by—SAMUEL DRAKE ROBERTS, The Elms, Gomersal, Yorkshire, worsted manufacturer, 250; WM. SCHOLES, Scill House, Hightown, Birstall, Yorkshire, card maker, 250; HY. ROBERTS, Crow Trees, Gomersal, Yorkshire, worsted manufacturer, 200; EDWIN HALL PARKIN, Hightown, Birstall, Yorkshire, worsted spinner, 50; WM. PARKIN, Greenfield House, Hightown, Yorkshire, colliery master, 175; GEORGE WALTER ROBERTS, The Elms, Gomersal, Yorkshire, gentleman, 50; FREDERIC PARKIN, Greenfield House, Hightown, Birstall, Yorkshire, coal master, 25. The following shall be the first and present directors and officers:—SAMUEL DRAKE ROBERTS, WILLIAM SCHOLES, HY. ROBERTS, EDWIN HALL PARKIN, W. PARKIN. Solicitors, Messrs. WAVELL, PHILBRICK, FOSTER, and WAVELL.

KILMOREY LEAD MINING COMPANY, 10,000*l.*, in 2000 shares, of 5*l.* each.—The objects for which the company is established are the working, winning, or otherwise acquiring, washing, crushing, and smelting of lead, lead ore, black jack, calamine, and other ores, and products thereof respectively; and the dealing in the above matters, or any of them, whether raw, or otherwise rendered merchantable; and generally the carrying on of the businesses of mine-owners, coalowners, ironmasters, smelters, brick and tile makers, potters, farmers, and common carriers, and whether on account of the company alone, or with or for any other companies or persons, &c.; the purchasing or otherwise acquiring, in terms of an agreement bearing even date, and filed herewith, and made between the Kilmorey Mine Company and the South Kilmorey Mine Company of the one part, and Mr. WILLIAM CLOVE HUNT, of Chester, on behalf of an intended new company, about to be incorporated, and to be called "The Kilmorey Lead Mining Company (Limited)," of the other part, of the mines situate in the county of Flint, called the Kilmorey and South Kilmorey Mines, and their respective metals, minerals, fossils, earths, and products; and in order thereto, the carrying out of the terms and provisions of the said agreement; and the purchasing, taking in exchange, or on lease, renting, occupying, or otherwise acquiring, of any other lands and hereditaments, mines, &c., in Flintshire, or elsewhere in Wales, or in any parts of Great Britain; and other interests, rights, easements, &c.; the erecting, constructing, and establishing of machinery, smelting and other works; the importing and exporting of metals, ores, minerals, &c. The Memorandum is signed by—WILLIAM WEBB, 12, Bridge-street, Chester, 52; J. JONES, 144, Bridge-street, Chester, 55; JOHN PENLINGTON, 1, Eaton Villa, Eaton-road, Chester, 75; SAMUEL DUTTON, Sarvin-road, Chester, 63; EDWARD ROBERTS, Bunbury, Chester, 54; R. CUNNERS, 8, Northern Assurance Chambers, Liverpool, 36; THOS. HANNER, manager and secretary of the Liverpool Sailors' Home, Canning-place, Liverpool, 18; H. RICHARDS, 3, New Buildings, Bridge-street-row, Chester, 8. Registered without Articles.

CALCUTTA METROPOLITAN RAILWAY, 1,500,000*l.*, in 75,000 shares, of 20*l.* each.—The objects for which the company is established are the making, maintaining, and working of a railway across the River Hooghly, at Calcutta; the making, maintaining, and working of any other railways in or near, or connected by railway with Calcutta or its suburbs. The entering into contracts with another company, or companies, or with the Indian Government, respecting the making, maintaining, or working of any such railway, or railways, as aforesaid. The application for and obtaining of any Act or Acts of Parliament in connection with the matters aforesaid, or any of them, and the doing all such other things as are incidental or conducive to the attainment of the above objects. The Memorandum is signed by—Mr. R. SCOTT, 62, Morgate-street, secretary to the India Tramway Company, 1; HENRY KIMBER, Gresham House, Old Broad-street, solicitor, 1; CHARLES FOX, 8, New-street, Westminster, engineer, 1; CHARLES A. ELLIS, Gresham-house, solicitor, 1; FRANCIS FOX, New-street, Westminster, engineer, 1; FREDERICK CHARLES DANVERS, India Office, Westminster Civil Service, 1; J. CARY, 49, Pall Mall, 1.—Registered without articles.

INDO-EUROPEAN TELEGRAPH COMPANY, 450,000*l.*, divided into 18,000 shares, of 25*l.* each.—The objects of this company are to establish, maintain, and work telegraphs in and between Europe and Asia, and particularly between England and India. To purchase and acquire any concessions or privileges already granted, or to be granted, in furtherance of such purposes, by the Prussian, Russian, Persian, or other Governments and authorities; and to undertake and to fulfil the obligations incident to such concessions and privileges. The Memorandum is signed by—Hon. R. GRIMSTON, 24, Mount-street, Grosvenor-square, 40; W. H. BARLOW, 2, Old Palace-yard, civil engineer, 40; Colonel J. HOLLAND, Hampden-lodge, Cintra-park, Upper Norwood, 40; W. E. QUENTELL, 12, Austinfriars, merchant, 40; C. B. SKINNER, 57, Eccleston-square, merchant, 100; C. W. SIEMENS, 3, Great George-street, civil engineer, 1200; J. H. TRITTON, 54, Lombard-street, banker, 100; Major-General G. B. TREMENHEERE, 12, Spring-grove, Isleworth, 40. The first representative directors—Colonel VON CHAUVIN, Director-General of Telegraphs of the North German Confederation for the Government of Prussia; and General VON LUDURS, Director-General of Imperial Telegraphs in Russia for the Government of Russia. First ordinary directors—W. H. BARLOW, F.R.S., Member of Council of the Institute of Civil Engineers; J. H. GOSSLER (J. B. Gossler and Co.), Hamburg; the Hon. R. GRIMSTON, Chairman of the Electric and International Telegraph Company; L. OESTERREICH, St. Petersbury; Colonel J. HOLLAND, Chairman of Reuter's Telegram Company (Limited); H. H. MEIER (H. H. Meier and Co.), Bremen; W. E. QUENTELL (Truhling and Goshen), London; C. B. SKINNER (Jardine, Skinner, and Co.), Calcutta; Major-Gen. G. BORLASE TREMENHEERE, Bengal Engineers; and J. H. TRITTON (Barclay, Bevan, Tritton, Twells, and Co.), London; and shall be entitled to act as directors, subject, as to each of them, to his taking shares representing 1000*l.* of the capital. Remuneration, 3000*l.* per annum; and whenever the dividend or dividends shall exceed 15*l.* per cent. per annum the directors shall be entitled to set apart and divide, as aforesaid, such additional sum (if any) as shall be voted by the company in general meeting. Messrs. SIEMENS and Co. contract to construct the lines for 400,000*l.*, to be paid in ten instalments of 40,000*l.* each, and to take shares in the company to the amount of 85,000*l.* C. W. SIEMENS, F.R.S., of Great George-street, Westminster, whilst he shall be a member of the company, may attend all board meetings, and give advice and counsel on all subjects discussed thereat connected with the promotion of the company's undertaking.

MINING NOTABILIA

[EXTRACTS FROM OUR CORRESPONDENCE.]

EAST PROVIDENCE.—At the 94 north, in the Carbona, we have a most important improvement; the part of the lode already cut into is worth 10*l.* per fathom, but it appears to be much longer and more valuable than is yet seen or can be reported. Besides other operations, there have been 10 pitches set to 20 men, at an average tribute of 11s. in 1*l.* The mine looks better than it has for years past.

At EAST WHEAL GRENVILLE, the lode in the shaft sinking below the 110 fm. level is worth 2 tons of good yellow copper ore per fm., and looks promising for an early improvement. The caunter lode in the 95 east (which is a new feature, the lode not having been seen in the upper levels) is worth 15*l.* per fm; and in a rise in the back of the level the lode is worth upwards of 20*l.* per fm. The prospects of the mine are excellent.

The new tin lode, just discovered in the 120 fm. level, in WHEAL GRENVILLE, has not yet been cut through. So far as seen it is of good value, and is likely to prove a large and productive lode. As soon as its underlie is ascertained, cross-cuts will be commenced to intersect it in the upper levels. The old lode is looking well in the 100, 90, and 80 fm. levels; and the tin raised in March will, it is expected, leave a profit upon the month's workings.

REDMOOR MINE, which has been almost unheard of for a long time, is likely to turn out well. In conteaning a part of the sett some time since a fine tin lode was discovered. Within the last few days an old adit has been cleared up, and in which the lode has been met with; the lode appears to have been worked many years ago for copper, as the tin is now standing in the side of the adit, and the stuff taken away in clearing the level produces ½ cwt. of tin per ton. This alone is good work, and as the adit gives a back of 25 fms. on the lode, the discovery is an important one.

WEST ST. IVES.—We learn that one of the principal shareholders in this promising mine, which was so fully described in last week's Journal, has since sent his own agent to inspect the property, and who fully confirms the favourable account given of it. His advice is to extend the cross-cut to No. 2 lode with all possible speed; and as the ground is soft and cheap for driving (not costing more than 2*l.* per fathom); and as the lode will be intersected by the cross-course in an unusually good stratum of ground, he speaks confidently of their meeting with a good course of tin, when they would have a profitable mine at once. Should this be the case, the value of a productive mine, which is worked so cheaply, would be very greatly increased.

SUMMER HILL.—Shareholders should hold their shares, and before being frightened, ask themselves this question—"Is there a sufficiently legitimate cause for such a great depreciation in price?" Certainly the actual position of the mine shows no reason for any decline in their value.—H. G.

NEW DEVON CONSOLS.—This company's agent writes of Trewallock Mine—"There is a further improvement in the Doctor's, or new lode; it is now yielding splendid lumps of lead; it is a kindly pretty lode for the 2 fathoms opened on, and is composed of peach, prian, and fine stones of lead. This looks cheering. We shall go on to open further upon it before deciding what course to adopt for its development. The ground is getting better in the engine-shaft."

WHEAL MARY FLORENCE.—Particulars are to hand of a fine discovery in this mine at the 25 fm. level, where a good lode has been passed over for between 60 and 70 fms. long. The ore is rich, and all standing in the bottom of the level, and also has reserves over it, but they are at the depth for another level, which will give 10 fms. of backs. We are, therefore, likely to have startling accounts from here soon. It is just the locality where mines make very rich from the 30 to the 60 fm. level.

MINERA UNION MINING COMPANY.—The directors have appointed Mr. William Ward, of Crosby House, Bishopsgate, the London agent of the company, from whom all information can be obtained.

LUCY PHILLIPS.—The *Columbia Press* (Jan. 11) states that Mr. George Coggan has arrived from La Grande, for the purpose of freighting the machinery of the company's quartz mill over the Blue Mountains, in order to facilitate its transportation to South Boise in the spring. It will be carried by wagons and sleighs over the summit into Grande Ronde Valley, where it will be stored until the roads are fit to travel.

The Mining Market; Prices of Metals, Ores, &c.

METAL MARKET—LONDON, APRIL 17, 1868.

COPPER.	£ s. d.	£ s. d.
Best selected..p. ton	83 0 0-	86 0 0
Tough cake and tile	80 0 0-	83 0 0
Sheathing & sheets.	84 0 0-	87 0 0
Bolts	83 0 0-	—
Bottoms	86 0 0-	88 0 0
Old (Exchange)	68 0 0-	70 0 0
Burra Burra	83 10 0-	84 0 0
Wire.....per lb.	0 1 0-	0 1 0½
Tubes	0 0 11¼	1 0

BRASS.	Per lb.
Sheets .....per lb.	9d.-10d.
Wire ..... ,,	8½d.-9½d.
Tubes ..... ,,	10½d.-11d.
Yellow Metal Sheath.p. lb.	7¼d.- —
Sheets ..... ,,	7 d.- —

SPELTER.	Per ton.
Foreign on the spot. £20	5 0-20 7 6
,, to arrive .. 20	5 0-20 7 6

ZINC.	
In sheets £26	0 0- —

TIN.	
English blocks	98 0 0
Do., bars (in barrels)	99 0 0
Do., refined	101 0 0
Banca £96	0 0-96 10 0
Straits	94 0 0-94 10 0

TIN-PLATES.*	Per box.
IC Charcoal, 1st qua.	1 7 0- 1 10 0
IX Ditto, 1st quality	1 13 0- 1 16 0
IC Ditto, 2d quality..	1 5 0- 1 7 0
IX Ditto, 2d quality..	1 11 0- 1 13 0
IC Coke	1 3 0- 1 4 0
IX Ditto	1 9 0- 1 10 0
Canada plates, p.ton..	13 10 0- —
Ditto, at works	12 10 0- —

IRON.	Per ton.
Bars Welsh, in London	6 5 0- —
Ditto, to arrive	6 2 6- 6 5 0
Nail rods	6 15 0- 7 0 0
,, Staffd. in London	7 7 6- 8 10 0
Bars ditto	7 7 6- 9 10 0
Hoops ditto	8 5 0- 9 15 0
Sheets, single	9 0 0-11 0 0
Pig No. 1, in Wales	3 15 0- 4 5 0
Refined metal, ditto	4 0 0- 5 0 0
Bars, common ditto	5 10 0- 5 15 0
Do. mrch. Tyne or Tees	6 10 0- —
Do., railway, in Wales	5 10 0- 5 15 0
Do., Swed. in London.	10 5 0-10 10 0
To arrive	10 5 0-10 10 0
Pig, No. 1, in Clyde	2 12 9- 2 17 0
Do. f.o.b. Tyne or Tees	2 9 6- —
Do. Nos. 3, 4, f.o.b. do.	2 6 6- 2 7 0
Railway chairs	5 10 0- 5 15 0
,, spikes	11 0 0-12 0 0
Indian Charcoal Pigs, in London p. ton..	7 0 0- 7 10

STEEL.	Per ton.
Swed., in kegs(rolled)	14 5 0- —
,, (hammered)	14 15 0-15 0 0
Ditto, in faggots	16 0 0- —
English, spring	17 0 0-23 0 0
QUICKSILVER (p. bottle)	6 17 0- —

LEAD.	Per ton.
English Pig, com.	19 10 0-19 12 6
Ditto, LB.	19 15 0- —
Ditto, WB	21 10 0- —
Ditto, sheet	20 5 0- —
Ditto, red lead	20 15 0- —
Ditto, white	27 0 0-30 0 0
Ditto, patent shot	22 10 0-23 0 0
Spanish	18 15 0-19 0 0

* At the works, 1s. to 1s. 6d. per box less.

REMARKS.—The Metal Market during the past week has continued to exhibit signs of renewed vitality, and the amount of business transacted has much improved, while increased firmness has been manifested in the prices of certain metals, especially in those which are of the greatest value; and there now seems every reason to expect that the market has taken a turn for the better, and that the period of low prices, which has so long pervaded the market, is now passing away, and that it will be found that gradually prices of most metals will become enhanced, and a scale much more remunerative to makers generally will be established. The present improvement in the aspect of commercial affairs will tend to the restoration of confidence and the invigoration of operations of a speculative character, which will be calculated to introduce more life into the trade. Rumours have been afloat tending to cause fear that the peace of Europe is not unlikely to be broken ere long, and that France was advancing towards an attitude of war, and this, if uncontradicted, would have been calculated to retard and prevent the improvement in trade now taking place. We are glad, theretore, to find that M. Baroche, the Minister of Public Worship in France, has taken the opportunity of laying the foundation-stone of a church to endeavour to remove this unfavourable impression. He states that the Emperor desires peace, and that the finances of the State will be occupied for a number of years in objects of a peaceful character, and that he is convinced that no nation of Europe entertains any idea of declaring war against France, and that he is enabled to state that the peace of Europe will not be disturbed. This is very satisfactory, and will tend to remove all doubts on the matter, so that we may fully rely upon no hindrance to the present improvement in business being retarded by fear of war.

COPPER.—The market still continues in an improving condition, the demand is decidedly better, and prices are becoming much firmer. Business has been done in English tough cake at 80*l.* 10s., in Wallaroo at 83*l.*, and in Chili bars at 76*l.*, and for arrival at 77*l.* It is rumoured that the English smelters are about to re-establish the Union for fixing prices from time to time; but as yet no official announcement of the fact has taken place.

IRON.—In Staffordshire the result of the quarterly meetings has not encouraged the expectation of any speedy improvement in the state of the trade in South Staffordshire. The present consequence of the notice of reduction in wages in South Staffordshire is that the men have struck. It is not, however, apprehended that the strike will last long; however, in the meantime, it very much interferes with business, and it is much to be regretted that some plan cannot be adopted, with the consent of both masters and men, by which these deplorable strikes might be prevented, and a fair rate of wages established. In Welsh, contracts for rails are being carried forward with greater freedom, principally on foreign account, and the home railway companies are making preparations for considerable purchases. Last month the exports reached 5154 tons, of which New York alone took 3725 tons, and there is a prospect of a further increase in the shipments to America. Pig-iron is in average demand, prices having a tendency to stiffen. In Swedish iron the amount of business transacted is only moderate. In Scotch pig-iron the market has been quiet, but pretty steady during the week; the price at one time advanced to 52s. 6d. cash, but afterwards declined to 52s. 3d. cash.

LEAD.—The market still remains rather quiet, the demand being less active; prices, however, remain firm.

TIN.—The improved feeling in foreign has been maintained during the week, and business continues to be done in Straits at 93*l.* 10s. to 94*l.* cash. Towards the close of the week, however, prices have become a little firmer, and transactions have occurred at 94*l.* cash, under which holders now decline selling.

SPELTER.—Very little business has been done during the week, the demand being very limited; the price on the spot, however, remains as formerly quoted.

TIN-PLATES.—There is a greater degree of activity manifested in the trade than has been evinced for several months past, and prices are now becoming decidedly firmer, with every prospect of a further advance.

STEEL.—There is rather more business now doing.

QUICKSILVER is in moderate request.

BIRMINGHAM, APRIL 17.—Rylands' "Iron Trade Circular" says—"An increased animation shows itself in the iron trade with the end of the week. Sales of pigs were brisker at the market, and manufactured iron is on order as well for the home trade, now reviving, as for export. The strike is virtually over before it has began, as the men are coming in now the holidays are over. It should be known that the society which passes the desperate resolutions is not the district Union, which has the money, but a bankrupt one, broken up from the North, that wishes to unite with it and share its funds."

The settlement of the fortnightly account in the MINING SHARE MARKET took place on Thursday, and business generally during the week, interrupted as it has been by the Easter holidays, has not been very extensive, nor have prices been at all well sustained. The chief business has been in West Chiverton, Prince of Wales, West Frances, Wheal Emily Henrietta, Chiverton Moor, Marke Valley, East Grenville, Wheal Grenville, Great Retallack, Chontales, Carn Brea, and a few others. Marke Valley shares have improved, and been in demand at 6¼ to 6¾, ex div.; at the meeting, held on Thursday, the accounts showed a profit on the quarter of 1979*l.* 8s. 6d., and a dividend of 4s. per share (1800*l.*) was declared, leaving a balance in favour of the mine of 2110*l.* 14s. The report is favourable; Marke's lode has been intersected in the 124 fm. level, in the east end worth 2 tons, and west 2 tons of copper ore per fm.; on Rosedown lode, the 80 west is producing 1 ton of ore per fathom; the 70 west, 1 ton; the 60 west, 2 tons; the 50 west, 2 tons; the 40 west, 5 tons; and the 40 east, 5 tons; the stopes and pitches continue very productive, and the mine shows every prospect of a long continuance. At Carne Camborne meeting, a call of 1s. 6d. per share was made; the accounts showed a balance in favour of the mine of 45*l.* 6s. 4d.; the agent reports that he considers the mine has improved during the past quarter, and he fully calculates on its becoming profitably productive when developed at the deeper levels; in the upper levels the strata were in a disordered state, but the 70, as well as the shaft below, are getting into settled granite. Bedford United, 25s. to 30s.; Carn Brea, 19 to 21; Clifford Amalgamated, 5¾ to 6.

West Chiverton, 64½ to 66½; the 110, east of Hawkes's, is worth 20*l.* per fathom; the south part, 50*l.* per fathom; the 110 west, 80*l.* per fathom; the 100, west of Burgess's, 10*l.* per fathom on the south part; the 100, west of cross-cut, 60*l.* per fathom; the 100, east of cross-cut, 45*l.* per fathom; the 100, west of No. 3 winze, 60*l.* per fathom; and east, 50*l.* per fathom. Chiverton Moor shares declined to 5½, but leave off 5¾ to 6; the lode was cut poor at the 65 about a week ago, which caused the decline in shares, but it is generally expected that it will come into ore driving west. Prince of Wales shares have not been so firm, and leave off 47s. 6d. to 50s.; the 65 east is looking more promising. Mr. Jehu Hitchins has been underground this week with Capt. Giffard to make a thorough inspection of the mine for the committee, and the conclusions arrived at are considered very satisfactory. There can be no doubt Mr. Hitchins thinks the principal course of ore is dipping east and the other west, and the cross-cut so far, at the 65, is between the dips of ore. In the 65 end east the ore-bearing part of the lode is now 18 inches wide, yielding good stones of ore, letting out more water, and, in the opinion of Mr. Hitchins, getting into the dip of ore, which may be reached in a few days. The 55 east is now worth 30*l.* to 40*l.* per fathom, and this level has gone over 50 to 60 fathoms of ore ground, worth 50*l.* per fathom; and as the end is 12 fathoms ahead of any stope, there is a very large piece of rich ore ground here untouched, and the total reserves throughout the mine he estimates at 16,000*l.* to 18,000*l.*, enough, he states, to return 1000*l.* per month for 18 months, without any further discovery; while at the present moment two of the ends are worth 58*l.* per fathom, and opening out ground, and there are six ends driving, all of which are expected to become productive. As so much disappointment has been felt at not meeting with ore ere this at the 65, we have thought it might satisfy the minds of some of the shareholders at least to learn the result of Mr. Hitchins's inspection, and the opinion he has expressed to the committee that the mine will be a lasting and profitable one.

Wheal Basset, 65 to 67½; at the meeting, held on the 7th inst., the accounts showed a profit of 380*l.* 14s. 2d. on the two months' working, and a dividend of 1*l.* per share (512*l.*) was paid, leaving 17*l.* 8s. 1d. in hand. In the tribute department they have pitches working on copper from 4s. 6d. to 13s. 4d., and from 6s. 8d. to 12s. in 1*l.* for tin. Cook's Kitchen, 11 to 12; Drake Walls, ⅜ to ¾; East Caradon, 3½ to 3¾; East Carn Brea, 22s. 6d. to 27s. 6d. Chontales shares were knocked down to 3½ on Wednesday, owing to a paragraph in an evening paper of the 14th instant, stating "a large number of shares had come to market, private advices being very unfavourable." The mail has not yet arrived, and we are authorised to state no advices whatever has been received at the office beyond that published in the Journal of Saturday last. Shares leave off 3⅝ to 3¾. East Grenville, 35s. to 40s.; the lode in the shaft is worth 2 tons of good copper ore per fathom; the lode in the rise above the 95, going up in whole ground, is worth 20*l.* per fathom. Wheal Grenville, 38s. to 40s; East Gunnislake, 20s. to 25s.; East Lovell, 8½ to 8¾; East Russell, 7s. 6d. to 12s. 6d.; Frontino and Bolivia, 13s. to 15s.; Great Laxey, 16½ to 17½; Great Retallack shares have been more in request, at 2¼ to 2½; Great South Tolgus, 10s. to 12s. 6d.; Great Vor, 18 to 19; Herodsfoot, 38 to 40; North Chiverton, 4 to 4½; North Crofty, 2⅞ to 3⅛; North Roskear, 10 to 12; Emily Henrietta, 23½ to 24½; North Treskerby, 22s. 6d. to 25s.; Okel Tor, 10s. to 15s.; Providence Mines, 28 to 29; South Frances, 19 to 21; Tincroft, 14½ to 15½; West Frances shares advanced to 42, 44, and leave off 37½ to 42½; West Prince of Wales, 9s. to 11s. West Seton, 205 to 210; at the meeting a dividend of 5*l.* per share was declared; the report of the mine is very favourable. Wheal Chiverton, 2⅝ to 2¾; Wheal Margaret, 5 to 6; Wheal Mary Ann, 21 to 22; Wheal Seton, 75 to 80; Wheal Trelawny, 8 to 8½; Wheal Uny, 39s. to 41s.; West Drake Walls, 7s. to 9s.

The market for Foreign Mine Shares on the Stock Exchange has been rather active. Del Reys fell early in the week to 20, 21, rose to 22, 23, and close flat at 20½ to 21½. The news is read unfavourably, but the outside public buy the shares, and prices are maintained. Chontales fell at one time to 3½ sellers, but have somewhat recovered. Don Pedros are steady, at a fractional advance. The subjoined are the closing prices of the shares mostly dealt in:—Don Pedro, 2⅛ to 2¼ prem.; Anglo-Brazilian, ⅛ dis. to par; Chontales, 3½ to 3¾; Pestarena, ⅜ to ½ dis.; Rossa Grande, 1-16th dis. to 1-16th prem.; Frontino and Bolivia, 9-16ths to 11-16ths; Central American, ¼ dis. to par; Port Phillip, 1⅜ to 1½; Nerbudda Coal, 1⅜ to 1½ dis.; Quebrada, ½ to ⅝; Yudanamutana, 2¼ to 2½. In British Mines there has been only a moderate amount of business doing. West Chivertons are firm, at 64½ to 65½. The various points of operation continue as rich as ever. The lode in the 110, or bottom level west, is valued at over 80*l.* per fm. Chiverton Moor shares fell to 5¼, 5½, on it being known that the lode had been cut, but speedily recovered the fall, and close 5⅝ to 5¾. Chivertons are steady, at 2⅞ to 3; there are some very promising points now being prosecuted in the mine likely to lead to good results, and shares selling for a very nominal figure. Chiverton Valley, 4½ to 5. Prince of Wales shares continue to be largely dealt in, but are lower in price, being last quoted at 47s. to 49s. Great Vors are steady, at 18 to 19; Great Laxey, 16¾ to 17¼; West Frances shares have had a good rise. Mary Ann Trelawny, West Caradon, and North Crofty are enquired for. North Wales Mines are unchanged in quotations. Mineras are 165 to 175; Maes-y-Safn, 25 to 28. Glan Alun, 7s. to 8s.; in this latter mine the prospects are very good.

IRISH MINE SHARE MARKET.—These last few days have been devoted by all who have time and money to spare to join in the hearty welcome—such as only Irishmen can give—to H.R.H. the Prince of Wales and his gentle Princess, with her all-enchanting amiability; and, of course, business on the Stock Exchange has, consequently, scarcely been thought of, except by those who had to adjust their accounts. But just before this stirring event mining shares were in increasing favour, prices improving daily, until sales set in for realisation of considerable profits. Mining Company of Ireland shares have gone up since the 4th of this month from 18*l.* 5s. to 19*l.* 17s. 6d., showing an advance for the fortnight of 1*l.* 12s. 6d. per share (7*l.* paid), but with a tendency to sales. Wicklow Copper (2*l.* 10s. paid) after reaching 18*l.* 15s., have since the meeting, when a dividend of 6s. per share, or at the rate of 24 per cent. per annum, was declared, gone back to 13*l.*, leaving off, however, in request. Cape Copper shares have also advanced from 10*l.* 10s. to 11*l.* 7s. 6d. The Carysfoot Mining Company will scarcely be quoted again, the shareholders having determined to wind-up the company, in consequence of the

unfavourable character of Prof. Sullivan's report on Ballintemple Mine, and the last call having been responded to only to the amount of 2600*l.*, leaving 1800*l.* still outstanding. It will be seen in the course of time whether the scientific, and, therefore, purely theoretical, opinion of Prof. Sullivan, and the fact that the company has been impoverished by pursuing for many years an unsettled, but most expensive, course of working many other parts of their extensive mining property, will deter practical miners from re-working Ballintemple. A wiser course has been adopted by the Connorree Mining Company at their adjourned meeting, held last Saturday, when it was resolved to adopt, in preference to any other, the report of their own able agent—Capt. Bishop,—who after several years' experience in the mines must understand the various features of them better than a casual inspector could do. From statements made by Mr. Robert Greer, who presided on the occasion, and by Mr. Macready, the Chairman of the company, it appears that Capt. Bishop's report is very favourable, and the *bona fides* of his opinion proved by the fact that he recently became the purchaser of 50 shares in the undertaking. Shareholders representing 27,500 shares have agreed to support the mine, and 1300*l.* have already been subscribed towards a resuscitation fund, so that there is every prospect that all shareholders who can find the necessary means will contribute to further prosecute their mines. A few interesting figures, which presented themselves during the proceedings, we intend giving in next week's Journal, as well as a condensed report of the proceedings of the Wicklow Copper Mining Company, also held last Saturday. Taking the value of sulphur ore at 17s. 6d. per ton, a very low price, the estimated profit for the last half-year's account amounts to 5616*l.* 5s. 4d., out of which a dividend has been recommended and declared at the rate of 24 per cent. per annum, or 6s. per share (5100*l.*), payable on May 1, free of income tax. The balance of 516*l.* 5s. 4d. has been added to the reserve fund.

The Council of Supervision of the PRUSSIAN MINING AND IRON-WORKS COMPANY (Preussische Bergwerks und Hutten Actien Gesellschaft) has resolved to issue the third, fourth, and fifth series of 2000 shares each (in all, 6000 shares=1,200,000 thalers), amounting to the sum of 180,000*l.* The shares are 30*l.* each, and the holders of shares of the first and second series have the right to take the shares of the new issue at par, in the proportion of one share in the new issue for each share now held. The instalments are payable—10 per cent. upon application, and the remainder as required. The right to the allotment must be exercised before May 20, after which date any shares not applied for will be allotted to shareholders desiring more than their *pro rata* proportion. The advertisements referring to the issue will be found in another column.

The directors of the SAO VICENTE MINING COMPANY have notified that the list of applications for shares will be closed to London applicants on Wednesday, but country and foreign applications will be received up to Saturday next. It is understood that Capt. Thomas Treloar, since his return to this country, has reiterated his favourable opinion as the great value and capabilities of the mine.

At the Swansea Ticketing, on Tuesday, 1957 tons of ore were sold, realising 25,827*l.* 16s. The particulars of the sale were—Average standard for 9 per cent. produce, 99*l.* 10s.; average produce, 17; average price per ton, 13*l.* 3s. 11d.; quantity of fine copper, 332 tons 14 cwts. The following are the particulars of the sales during the past month:—

Date.	Tons.	Standard.	Produce.	Price per ton.	Per unit.	Ore copper.
March 24	1246	£37 5 0	16¾	£12 12 6	15s. 1d.	£75 7 6
April 14.	1957	99 10 0	17	13 3 11	15 6	77 10 0

Compared with the last sale, the advance has been in the standard 2*l.* 5s., and in the price per ton of ore about 7s. 6d.

At West Wheal Seton meeting, on Tuesday, the accounts showed a credit balance of 3083*l.* 5s. 2d. A dividend of 2000*l.* (5*l.* per share) was declared. Capt. Malachi Bath was appointed the future manager of the mine, in place of the late Capt. Chas. Thomas. Mr. Hidderley gave notice that he would at the next meeting move that the salary of Capt. Bath be increased from 10*l.* 10s. to 12*l.* 12s. per month; and that Capt. John Jennings's salary be also increased from 9*l.* 9s. to 10*l.* 10s. per month—2*l.* 2s. of which is to be considered especially for keeping up the plans and surveys of the mine. It was moved by Mr. John H. Budge, seconded by Mr. Holman, and resolved that it is desirable that another underground agent should be added to the present staff of the mine, at a salary of 8*l.* 8s. per month, whose duty it shall be alternately with Capt. J. Jennings to take the day and night core, and that a suitable person be selected to fill this office, and that Messrs. P. P. Smith, Richard Hidderley, and William Harris, with the purser, be requested to make such appointment.

At the Dolcoath Mine meeting, on Monday, the accounts showed a profit on the two months' working of 1439*l.* A dividend of 1432*l.* (4*l.* per share) was declared. A resolution was passed to record regret for the loss of Captain Charles Thomas; his son, Captain Josiah Thomas, was appointed to succeed him. Mr. M. G. Pearse observed that in looking over the report that it was one of a cheering and satisfactory character. On the last occasion he thought it was not up to the mark. They were well aware those fluctuations were of frequent occurrence; it was, however, always a matter of congratulation to find the ends and winzes maintaining their value. It behoved them, however, not to be too sanguine when their report was over an average value, or too desponding when below. The main thing wanting was a better price for tin to give them the prosperity of former days. They had passed through a long and wearisome period of depression. He had, amidst it all, never lost faith that the reaction would come, and now he believed it had commenced.

At Maesysafn Mine, North Wales, a dividend of 15s. per share was declared in March.

At Cwm Erfin Mine, Cardiganshire, a dividend of 15s. per share was declared on April 8.

At Marke Valley Mine meeting, on Thursday (Mr. B. Warburton in the chair), the accounts showed a credit balance of 2182*l.* 13s. 4d. The profit on the three months' working, ending February, was 1979*l.* 8s. 6d. A dividend of 1800*l.* (4s. per share) was declared. Capt. John Truscott reported that the mine continued very productive, with every prospect of a long continuance.

At Brookwood Mine meeting, on Wednesday (Mr. J. C. Isaacs in the chair), the accounts for the four months, ending January, showed a credit balance of 1544*l.* 18s. 2d. The profit on the four months' working was 477*l.* 18s. 2d. A dividend of 500*l.* (2s. 6d. per share) was declared. Capt. T. Trevillion reported upon the various points of operation.

At the New Great Consols Mine meeting, on Monday (Mr. Henry L. Phillips, managering director, in the chair), the report of the directors and balance-sheet were received and adopted. Details in another column.

At Bedford United Mines meeting, on Thursday (Mr. W. A. Thomas in the chair), the accounts showed a credit balance of 23*l.* 8s. 7d. A call of 4s. per share was made. Capt. James Phillips reported that the samplings have been materially assisted in the past quarter from the north lode, and the lode at present is much improved in appearance and value.

At West Rose Down Mine meeting, on Thursday (Mr. W. Fawcett in the chair), the accounts showed a credit balance, when all calls are paid, of 35*l.* 9s. 6d. A call of 12s. 6d. per share was made.

At Carn Camborne Mine meeting, on Tuesday (Mr. M. Phillips in the chair), the accounts showed a debit balance of 182*l.* 1s. 8d. A call of 1s. 6d. per share was made. Capt. John Truscott considered the mine had improved during the past quarter, and he fully calculates upon its becoming profitably productive when developed at deeper levels.

At Wheal Seton meeting, on Monday (Mr. Harry Tilly in the chair), the accounts showed a loss on the two months' working of 75*l.* It was resolved that the unavailable credit balance of 4192*l.* should no longer be carried forward as a credit balance, such a course being calculated to mislead. It was determined that in future all the produce of the mine be sold by ticket, and that all coal be furnished by tender. It was also resolved to purchase a weighing machine, the materials having been purchased for 30 years without any weighing machine being on the mine.

At the Sulby River (Isle of Man) Mining Company meeting, held on Tuesday, at Douglas (Mr. A. W. Adams in the chair), the secretary (Mr. G. Maley) read the report of the directors, which stated that 3500 of the 6000 shares into which the company was divided had been taken up, and that it was necessary, in order to fully develope the mine, that the remaining 2500 shares should be at once issued. The report was adopted, and the directors were authorised to engage some experienced miner to report upon the mine, and it was resolved that his report be issued to the shareholders along with that of the directors. A considerable number of the new issue of shares were subscribed for at once; and Messrs. J. J. Coole and G. H. Wood were appointed auditors.

The Bank of England return for the week ending on Wednesday evening showed in the ISSUE DEPARTMENT a decrease in the "notes issued" of £1,320*l.* represented by a corresponding decrease in the coin and bullion on the other side of the account. In the BANKING DEPARTMENT there is shown a decrease in the "other deposits" of 989,197*l.*, and in the "seven day and other bills" of 28,105*l.*, together 1,017,302*l.*; an increase in the "public deposits" of 135,936*l.*, and in the "rest" of 6896*l.*, together 142,832*l.*=874,470*l.* On the other side of the account there is a decrease in the "other securities" of 917,319*l.*, and an increase in the public securities of 969*l.*=907,623*l.*, and deducting therefrom 874,470*l.* as above, there remains an increase in the total reserves of 32,189*l.*

COPPER TRADE.—Messrs. Vivian, Younger, and Bond (April 17) write:—The mail from Valparaiso has not yet been delivered, but news by telegram has been received that the charters will prove to be light, and that prices were advancing there. This, added to a good consumptive demand, both here and in France, has established the market on a higher basis, the last price paid for Chili bars having been 77*l.* for best brands, Liverpool spot. The transactions comprise about 500 tons bars, commencing at 75*l.* up to 77*l.*, and about 400 tons of refined ingots at 78*l.* and 79*l.* 10s. The bulk of the foregoing business has been out of second hands, as importers for the most part were unwilling to meet the market. A cargo of regulus was sold at 15s. 6d., but Cape ores at Swansea realised 15s. 9½d. per unit. A large business in English raw out of second hands at 80*l.* to 81*l.* for best selected, and 78*l.* to 80*l.* for tough in the dock here, whilst parcels from first hands have commanded 1*l.* to 2*l.* more delivered to consumers. Of Wallaroo cake 150 tons have been sold at 82*l.* 10s. cash, and 25 tons at 83*l.*, one month.

The Titanic Steel and Iron Company (Limited) have convened a meeting for the 30th inst., to pass special resolutions enabling the company to reduce its nominal capital, and to subdivide its shares. The offices of the company have been removed from Worcester to Coleford, Forest of Dean.

On the Stock Exchange a steady enquiry for Mining Shares has prevailed during the week. The following prices were officially recorded in British Mining Shares:—East Caradon, 3½; Great Wheal Vor, 18¼, 18; Marke Valley, 6¾; West Seton, 202; Great Laxey, 17½, 17. In Colonial Mining Shares the prices were:—Port Phillip, 1, 7-16ths; Yudanamutana, 2⅜, 2¼, 2 7-16ths; Cape Copper, 11⅜.—In Foreign Mining Shares the prices were:—Chontales, 4, 3⅜, 3 13-16ths, 3¼, 3⅜, 3¾; Don Pedro, 2¼, 2 5-16th, 2¼ prem.; Frontino and Bolivia, ⅝, 11-16ths, ⅝; Pestarena, 2½, 2⅜; St. John del Rey, 23, 23¼, 22½, 23¾, 22½, 21; Anglo-Brazilian, ⅝, 7-16ths; United Mexican, 1¾.

COAL MARKET.—The fresh arrivals this week only reached 92 ships. The cold weather produced an active demand for house coals, and we quote a rise in prices of about 1s. per ton. Hartley coals have been in steady request at last week's prices. Haswell Wallsend, 18s. 3d.; Hartlepool Wallsend, 17s. 6d.; South Hartlepool Wallsend, 16s.; Thornley Wallsend, 16s. 6d.; Tunstall Wallsend, 15s. 6d.: 7 cargoes unsold; 25 ships at sea.

COBRE COPPER.—At the half-yearly meeting of shareholders (reported in the Journal of Feb. 8) the Chairman, after alluding to the operations of the company for the year 1867, stated that the result would probably be a loss of about 1000*l.* In consequence, however, of the advance in the ores (at that time only estimated, but now nearly sold), in place of such loss there will be a profit of about that amount; and should the present price of ores be maintained, the estimates made by Mr. Clemes for the explorations of the unwrought ground belonging to the company, for which the new capital is proposed to be raised, will be reduced to the extent of nearly one-half of the sum originally named. This is satisfactory, and there can be no doubt from the present appearance of the copper market that prices are likely to improve.

CHONTALES.—As stated in last week's Journal, the remittance of gold by the mail now due amounts to 323 ozs., as the return for February. The last remittance, of 381 ozs., was the result of the previous two months' operations. As Mr. Belt arrived at the mines on Feb. 23, it is not unlikely that some special information, if not a detailed report, will be received by the present mail.

LEAD ORES.

Date.	Mines.	Tons.	Amount.	Purchasers.
April 11	Herodsfoot	62	£26 17 6	Stock and Co.
	13—Great Laxey	100	23 1 0	Sims, Willyams, & Co.
	14—Frank Mills	105	14 0 0	Sheldon, Bush, & Co.
	— ditto	35	9 13 6	Sims, Willyams, & Co.
	—Stipersiones	70	11 14 0	Thos. Kirkby.
	15—Deep Level	45	11 15 6	—
	16—Pyinlimmon	40	11 11 0	Sims, Willyams, & Co.
	—Whitewell	25	11 15 6	Washington Co.
	— ditto (grey ore)	10	11 3 6	ditto
	—Treweatha	11	24 1 6	Treffry's Trustees.

BLACK TIN.

Date.	Mine.	Ts. c. q. lbs.	Price p. ton.	Amount.	Purchaser.
April 14	Great Wh. Vor.	57 15 0 22	—	£3339 3 10	—

THE COPPER TRADE.

Messrs. Turnbull and Watson (Liverpool, April 15) write—The available stock of copper of all kinds in Liverpool, London, Swansea, and Havre, in fine copper, is estimated as follows:—

April 1, 1868..Tons 19,010 April 1, 1867 ..... 20,618 April 1, 1866..... 19,735
" ..... 19,010 March 2, 1868 .... 18,467 Feb. 1, 1868 19,692

Quotations of English tough and Chili bars, ores, and regulus were—

	April 1, 1868.	April 1, 1867.	April 1, 1866.
Tough ..... Ton	£78 0 0	£78 0 0	£90 0 0
Bars	73 10 0	71 10 6	86 0 0
Ores and regulus..Unit	0 15 3	0 14 3	0 16 6

According to the Board of Trade Returns for the United Kingdom, the imports and exports of copper for the first two months of the following years, estimated in fine copper, were as follows:—

	1868.	1867.	1866.
Imports—Copper in ores and pyrites	989	983	1725
" regulus	2382	2465	1913
" bars	2320	1454	920
Total	5691	4902	4558
Exports—Manufactured copper	3968	3796	2168
Unmanufactured copper	1648	942	865
Foreign copper	1908	1348	2509
Total	7524	6086	5542

Arrivals from the West Coast of South America during the past fortnight—Carrizal, from Valparaiso, 50 tons bars; Jessie Jamieson, Valparaiso, 146 tons bars; Otter, Valparaiso, 62 tons bars; Energy, Valparaiso, 21 tons bars; Hiamiota, Caldera, 245 tons ores; Worral, Caldera, 122 tons ores and 575 tons regulus; Nithsdale, Coquimbo, 131 tons ingots; Balcarry, Chanaral, 363 tons ores; Venezuelan, Colon, 50 tons Barilla; Powhatton, Tortoralillo, 84 tons regulus and 527 tons bars; Cavalier, Loto, 340 tons bars and 217 tons ingots. At Swansea—Tocopilla, from Tocopilla, 717 tons ores and 14 tons Barilla; Espilon, Caldera, 250 tons regulus; Aline, Caldera, 650 tons regulus; Glamorgan, 700 tons regulus.

Messrs. J. Pitcairn-Campbell and Co. say—The business transacted during the fortnight comprises—598 tons bars, at 73*l.* 10s. to 75*l.* 10s.; 190 tons regulus, at 15s. 3d. to 15s. 6d.; and 50 tons Barilla, at 15s. 6d. To arrive here—581 tons bars, at 73*l.* 10s. to 75*l.*; 1127 tons ore, at 15s. to 15s. 3d.; and 80 tons Barilla, at 16s. On the spot, Swansea—100 tons bars, at 73*l.* 10s.; 150 tons ingots, at 77*l.* to 78*l.*; and 700 tons ore, at 15s. 6d. To arrive, Swansea—320 tons regulus, at 15s. 6d.; and 109 tons ingots, at 78*l.*: 1257 tons ore sold by ticket at Swansea, average price 15s. 6½d. per unit. Arrivals at Liverpool during the fortnight—Hiamiota, from Caldera, 250 tons ore; Bolivar, Valparaiso, 200 tons bars; Powhattan, Totoralillo, 86 tons regulus and 516 tons bars; Carrizal, Valparaiso, 50 tons bars; Jessie Jamieson, Valparaiso, 85 tons bars; Otter, Valparaiso, 70 tons bars; Nithsdale, Coquimbo, 132 tons ingots; Energy, Valparaiso, 20 tons bars; Balcarry, Chanaral, 750 tons ore; Worrall, Caldera, 122 tons ore and 576 tons regulus. At Swansea—Glamorgan, from Carrizal, 690 tons regulus; Tocopilla, Tocopilla, 700 tons ore; Aline, Caldera, 655 tons regulus. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, are—

	Ores.	Regulus.	Bars.	Ingots.	Barilla.
Liverpool	2375	1080	4086	1764	120
Swansea	1067	—	—	150	64
Total	3412	1080	4086	1914	184

Representing about 7300 tons fine copper, against 10,700 tons fine copper April 15, 1867; 9990 tons fine copper, April 15, 1866; and 4300 tons, April 15, 1865.

COPPER ORES.

Sampled March 25, and sold at Swansea, April 14.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Knockmahon	92	12¼	£9 10 6	Cape	38	24⅜	£17 15 6
ditto	128	10⅜	8 1 6	ditto	36	33½	25 0 0
ditto	123	9	7 1 0	Mantua	81	8½	5 10 6
ditto	105	9⅛	7 0 6	ditto	80	8⅜	5 12 6
ditto	87	9⅛	7 0 6	ditto	79	8½	5 12 6
Cuba	161	18½	14 6 0	ditto	78	8½	5 13 0
ditto	100	18⅜	14 5 0	Residuum	13	30⅜	23 18 0
ditto	11	7⅛	50 9 0	Otea	47	10¼	7 13 6
ditto	99	18¼	14 2 0	ditto	44	10	7 10 6
ditto	98	18½	14 2 0	Precipitate	12	73	52 10 0
ditto	53	26¼	19 3 0	Casail	6	14⅜	10 14 6
ditto	52	26⅜	19 6	Spanish Ore	2	9½	7 5 0
ditto	7	69¼	50 4 0	ditto	1	19⅜	14 12 0
Cape	50	30½	23 2 6	British Reg.	46	11¼	9 1 0
ditto	50	36⅜	23 18 0	Argen. Reg.	9	35	26 10 0
ditto	50	30¼	23 19 0	Copper Ore	16	15⅜	11 4 6
ditto	50	30⅜	23 11 0	ditto	7	13½	11 4 0
ditto	50	30⅜	23 13 0	ditto	5	11¼	8 8 6
ditto	50	30¼	23 10 6	ditto	1	7⅜	5 9 6

TOTAL PRODUCE.

Knockmahon	535	£4125 17 6	Precipitate	12	£ 630 0 0
Cuba	521	8565 8 0	Casail	6	64 7 0
Cape	374	8647 19 0	Spanish Ore	3	29 2 0
Mantua	318	1780 13 0	British Regulus	46	416 6 0
Residuum	13	310 14 0	Argentif. Regulus	9	237 10 0
Otea	91	714 8 0	Copper Ore	29	305 12 0

COMPANIES BY WHOM THE ORES WERE PURCHASED:—

Copper Miners Company	27	£	149 3 6
Freeman and Co.	104½		1,365 18 3
P. Grenfell and Sons	100		1,425 0 0
Sims, Willyams, and Co.	56½		2,043 16 6
Vivian and Sons	194		1,861 15 0
Williams, Foster, and Co.	409½		5,307 18 3
Mason and Elkington	113		2,430 16 6
Bankart and Sons	28		154 13 0
Charles Lambert	560½		10,369 9 6
Sweetland, Tuttle, and Co.	364		2,721 5 6
Total	1957		£25,827 16 0

Copper ores for sale at Swansea, May 5—Knockmahon 850—Cuba Ore 813—Berehaven 250—Gwalla Ore 200—Paramatta Ore 93—Cape Regulus 84—Copper Regulus 80—Copper Ore 70—Almina Ore 16.—Total, 2456 tons.

TOTALS AND AVERAGES.

	21 cwts. Produce.	Price.	Standard.
Whole sale	1957 ..... 17	£13 3 11	£99 10 0

COPPER ORES.

NO SALE on Thursday last, April 16.

Copper ores for sale at the Royal Hotel, Truro, on Thursday next—Mines and parcels.—Devon Great Consols 1850—Marke Valley 455—Hingston Down 320—Brookwood 268—Okel Tor 260—Gawton Copper Mine 254—East Caradon 175—Prince of Wales 139—Wheal Friendship 80—New East Russell 46—Wheal Russell 43—Gonamena 41—Craddock Moor 33—Belstone 23—West Great St. George 17.—Total, 4004 tons.

Copper ores for sale at Tabb's Hotel, Redruth, on Thursday week.—Mines and parcels.—South Caradon 546—Great North Downs 480—Clifford Amalgamated 246—West Wheal Damsel 211—Phœnix Mines 165—Nangiles 34—Tywarnhaile 27—Pedn-an-drea 10—Grambler and St. Aubyn 7.—Total, 1726.

WATSON BROTHERS' MINING CIRCULAR.

"A. X." (Birmingham).—The shaft at Stray Park is down, we believe, 12 fms. below the 266; the lode is large, and producing a little tin. The mine immediately adjoins Dolcoath, and derives its prospects from that fact.

SATURDAY, APRIL 11.—Very little doing to-day. Emily Henrietta, Grenville, East Grenville, and Tincroft in demand. Chiverton Moor declined 5¾, sellers; Emily Henrietta, 22½ to 24; Grenville, 2 to 2⅛; East Grenville, 1⅞ to 2; Tincroft, 14½ to 15⅛; Chiverton, 5½ to 5¾; Prince of Wales, 51s. to 53s.

MONDAY.—Holiday.

TUESDAY.—Market very quiet, and prices merely nominal. Prince of Wales, 51s. to 53s.; Wheal Chiverton, 2½ to 3; Wheal Grenville, 39s. to 41s.; Chontales, 3⅞ to 4⅛; Carn Brea, 19 to 21; Chiverton Moor, 5⅜ to 5⅝; East Wheal Grenville, 38s. to 40s.; Great Wheal Yor, 18 to 19; West Chiverton, 64½ to 65½; West Frances, 39 to 41; West Prince of Wales, 9s. to 11s.

WEDNESDAY.—The market is very dull. Chontales, Grenville, East Grenville, Prince of Wales, Chiverton Moor, and East Caradon are freely offered at a reduction. West Frances and Marke Valley have improved. Chontales, 3½ to 4; Grenville, 38s. to 40s.; East Grenville, 55s. to 60s.; Prince of Wales, 50s. to 52s.; Chiverton Moor, 5⅜ to 5⅝; East Caradon, 3⅞ to 5⅛; West Frances, 42 to 44; Marke Valley, 6⅛ to 6¾.

THURSDAY.—Market very quiet, and dealers engaged settling the account. Emily Henrietta in good demand at 23½ to 24; Prince of Wales, 49s. to 51s.; Wheal Grenville, 38s. to 40s.; West Frances, 40 to 45; West Chiverton, 64 to 65; Great Retallack, 2¼ to 2½; Marke Valley, 6½ to 6¾; West Seton, 202½ to 207½; Chontales, 3⅞ to 3⅞; East Grenville, 55s. to 60s.

FRIDAY.—Market continues dull. Chiverton Moor advanced to 6. West Chiverton, Marke Valley, Seton, and Emily Henrietta in demand also at an advance. Chontales, 3⅞ to 3⅞; Prince of Wales, 47s. to 48s.; West Frances, 37½ to 40; Wheal Mary Ann, 21 to 22; Marke Valley, 6½ to 6⅝, ex div.; Great Retallack, 2¼ to 2½; East Grenville, 36s. to 38s.; Emily Henrietta, 23½ to 25.

TINNING THE INTERIOR OF LEAD PIPES.—An improved and very simple method of tinning the interior of lead pipes has been patented by Mr. PETER NAYLOR, of New York, U.S. The invention consists in a mode of applying to the interior of the pipe a flux that will protect the lead from oxidation, and insure a perfect coating of tin when the tin is poured through said pipe, or the pipe dipped into the bath of tin. After the lead pipe has been made, place the same in a vertical or nearly vertical position, and pass down through the same a strong cord, to which a weight is attached to draw the cord through the pipe, and at or near the other end of the cord a sponge, or piece of other porous elastic material, is attached, of a size to fill the pipe, and of any desired length—say 6 in., more or less. The flux employed is either grease or muriate of zinc, but any other flux may be used. The sponge or porous wad being saturated with this flux, is drawn through the pipe, and by its length insures the covering of the entire surface of the inside of said pipe with the flux, so that the melted tin, subsequently applied, will adhere to all parts with uniformity and firmness.

PLATINUM.—In a paper addressed to the Academy of Sciences, M. P. Schutzenberger describes a new compound of platinum, which he obtains by causing a mixture of pure oxide of carbon and dry chlorine to pass at a temperature of 400° centig. over the metal above mentioned in a spongy state. A considerable quantity of oxychloride of carbon is formed, but not without the active intervention of the platinum itself, which is transformed into a solid and volatile compound, and is obtained by sublimation in the cold part of the tube in which the experiment is carried on. The new body is of a flaky texture, and of a light yellow hue; it melts at 150° centig.; its colour then darkens until the liquid congeals into a crystalline mass, which will boil and distil at 350° centig. not, however, without being partly decomposed into its original metal and chloroxy-carbonic acid. Water will decompose the new body with effervescence, causing a deposit of black platinum.

UTILIZATION OF WASTE.—The man who first used the word "waste" as a designation for the residues that accumulate in many industrial processes, would probably have bethought himself of some more appropriate appellation if he had been able to foresee the many and various uses to which they are now applied, and the importance which they have attained in the community. Let us cite a few examples. The refuse ore which formerly used to obstruct the entrance to some German mines, to the great annoyance and disgust of the workmen, who considered themselves haunted by evil spirits, have become highly valuable since it was discovered that they contain metals so important as nickel and cobalt. The liquor which the manufacturers of soap formerly allowed to run off as useless is the only source from which we derive the all-important glycerin. The sulphuric acid which used to poison the atmosphere and to destroy vegetation in the neighbourhood of the works devoted to the roasting of sulphurets, is now carefully saved and converted into sulphuric acid. The "soda waste," which was permitted to accumulate in mountains in the respective factories, is now made to yield quite a number of useful products, such as sulphur, hyposulphite of soda, and others. We might continue to almost any length the enumeration of such articles that are manufactured out of materials which were formerly rejected as useless, and the utilization of which has always enriched the fortunate discoverer, by lessening the cost of the principal article, and thus enabling him to drive competitors who were without this advantage out of the market. What we want to impress upon the minds of our readers, and of all those concerned, is the certainty that in many instances still products, solid, liquid, and gaseous, are wasted, permitted to escape with the atmosphere, to fill the sewers, or to decay out of doors, which would yield a rich reward to the man who would turn them to serve some useful purpose. The greatest success must be his who can, at the lowest price, make the most of any given article. Nothing ought to be thought too insignificant for consideration. Let us remember the example of Lafitte, who by picking up a pin before the office of a banker who had rejected his services laid the foundation for a fortune of millions. Who knows but what even the carbonic gas which we are now glad enough to get rid of by our chimneys may hereafter be conveniently rendered useful in the economy of our households. We would, therefore, advise all manufacturers to let nothing leave their premises without examination and investigation; if you are unable to deal with the subject yourselves, consult some scientific expert with regard to it. Mines of gold, more reliable and more easily worked than those of California, may be nearer home than you imagine.—*Scientific American.*

LONDON GENERAL OMNIBUS COMPANY.—The traffic receipts for the week ending April 12 amounted to 10,632*l.* 16s. 2d.

Notices to Correspondents.

*** Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be *filed* on receipt: it then forms an accumulating useful work of reference.

GOLD.—Can any of your geological readers explain this circumstance—why, in certain degrees of latitude, both north and south, gold should prevail throughout the world? Any person well acquainted with the produce of gold from various parts can trace this fact round the globe.—A SUBSCRIBER.

EAST HOLYFORD MINING COMPANY—"J. B."—The company being properly registered under the Limited Liability Act, and the shares standing in your name being fully paid to the amount of the limit, the company has no further claim on you.

DRILLING MACHINES.—Can any reader inform me where I can learn the particulars as to "Abegg's Hand-Drilling Machine," alluded to in the letter of "B. G. D." on "Mine Machinery, and Machine Mining," in last Saturday's Journal?—DRILL: *Folkstone, April* 13.

*** With last week's Journal we gave a SUPPLEMENTAL SHEET, in which appeared—Prof. Smyth's Lectures at the Royal School of Mines *(concluded)*—Institution of Naval Architects—Institution of Civil Engineers—Society of Engineers—London Association of Foremen Engineers—Liquid Fuel—Lime Light—Crystallisation—the South Staffordshire Mine Agents, and the local Government Inspector—the Shropshire Coal Field—Prevention of Smoke—Liquid Gas—Waste of Mineral and other Natural Products—Mining Investment—Progress of Mining—Mining Machinery, and Machine Mining—West St. Ives Mine—Darien Canal.

THE MINING JOURNAL.

Railway and Commercial Gazette.

LONDON, APRIL 18, 1868.

THE IRONMASTERS AND THEIR MEN.

The accounts which reach us from South Staffordshire indicate a state of feeling between certain of the leading masters and their men, which is decidedly gratifying, and should not go unnoticed at a time when ironmasters are charged with "unapproachableness." We know of no former period during which there has been more communication during the first week of a strike between the men and their masters than has been perceived during the past week. Masters have not hesitated to encourage their men to seek interviews and explanations, and the men in their turn have not been reluctant to avail themselves of the opportunities. During these communications employers and employed have severally expressed themselves in terms which have manifested an anxious desire on both sides to prevent anything like ill-feeling as the result of the action which the former see to be unavoidable. We learn of one instance in which an interview was commenced on the side of an employer with—"Now, whatever takes place, let there be no ill-feeling between us, either now or hereafter." Mutual explanations were then exchanged. The men advanced very few unreasonable propositions, and, therefore, found very little difference existing between themselves and their employers. The former went into matters which show that they are capable of appreciating what are hinderances to successful trading, so far at least as those hinderances do not relate to the action of their own order. It was explained to them by firms who could afford to be so candid that even in their case it would have been much more to their pecuniary advantage if, during the past two years, their capital had been invested in Government Funds; whilst they need not remind the men how many and how severe had been the disasters which had characterised the district in that time. The men might have been members of the Commercial Credit and Morality Committee of the Liverpool Chamber of Commerce, for they at once intered into the question of Bankruptcy Legislation. Much of the evil they confidently attributed to the facilities which the Private Arrangement Clauses afford for men to embark in trade without a foreboding that if they should be unsuccessful they would be deprived of all commercial standing; and they illustrated their views by reference to local failures. Wisely the masters encouraged the consideration on the part of their men of subjects of this class, and reminded them of the large amount of good which, at the present juncture, they might effect if they should use their powerful organisations and their much influence with certain legislators in the removal of such anomalies.

The chief point upon which there was a divergence of view between the masters and the men was that in which the latter urged that if the price of certain staple products of the country was of necessity regulated by the price paid for the labour employed in its production, then that before any alteration was made in the price of the product labour should be consulted. Confining the attention of the theorists to their own trade, the impracticability of such a step was sketched. It was asked how it would be possible for such negociations to take place before an alteration in the price of iron should be declared; and next how, if all the masters and men could not meet, any scheme could be devised by which there should be such a representation as would be satisfactory to all? This course was pursued on this point by way of pleasantly continuing a dialogue which had hitherto been unobjectionable; but it was succeeded by a statement of the objection which Capital might be fairly considered to entertain to any such a proceeding. Here comes in that illustration of the relationship between Capital and Labour which has been so effectively used by CHARLES KNIGHT. He compares the two to as many persons upon horseback, only one of whom can ride in front and guide the steed Commerce, upon which both are travelling. Very few, surely, will hesitate as to which of the two should hold the reins. We would urge this consideration of the subject upon the ironworkers of Great Britain; and if the use of the illustration should induce them to look into the book in which it was first given they will, in perusing it, find information which will, in their experience, confirm the truth of its title that "Knowledge is Power."

In a much higher degree promotive of their interests will they find power of this class than that which they seek to secure by the aid of their combinations. Whilst the men, whose interviews with their masters we have sketched, were unable to do otherwise than admit that there was a needs-be for some such a course as the masters are now pursuing, still they left themselves at the mercy of the moving spirits in those combinations, as to the course which should be pursued—whether they should resume work, and earn their own and their families' livelihood, or remain unemployed. It would seem that the question of accepting or rejecting the reduction in wages which the masters offer is left to the decision of what is termed a National Conference, which is to come off in Stockton, on Tuesday next. But that is not the only topic to be submitted to the Conference. We incline to think that it will be a subsidiary topic, and that the principal subject discussed will be the scheme which the readers of this Journal are aware is being often revived amongst the ironworkers. It is announced that the feud between the two chief Unions is now to cease; that the leaders of the respective organisations, who have hitherto held aloof from one another, have shaken hands; and that they are now prepared to submit their several claims to one great constituency, by whom a selection is to be made of—"Under which King?" This question, though apparently of great significance in the eyes of the operatives, may be regarded as of comparatively small moment, inasmuch as the scheme is impracticable. Not insignificant, however, is the question of the acceptance or the rejection of the "drop," if that topic should really be brought forward for serious debate. If the Conference should determine to recommend the men to remain out, and the latter should act upon the recommendation, grave responsibility will have been undertaken by the delegates who tender the advice.

Already, through a shortness of work, most of the poor men in South Staffordshire are in a state of need, which makes it difficult for them to provide necessaries for their families. They have hitherto been getting scarcely half a loaf, and if they should reject that which may, probably, prove to be a three-quarter loaf, and prefer to depend upon the assistance which their fellows in the North of England and elsewhere may send to them, we have a painful foreboding that the cry for bread will be met with little better than the gift of a stone. It is probable, however, that the wages subject may have been virtually decided before the Conference meets; for, whilst the majority of the men seem to have placed themselves in the hands of the delegates, some others are acting upon their own responsibility. Influenced, in all probability, by a salutary firmness of procedure on the part of their employer, which this Journal advised last week, it is stated that the men in the employ of Mr. W. O. FOSTER, the commercial member for South Staffordshire, have resumed work at the reduced terms. Mr. FOSTER'S firm (Messrs. JOHN BRADLEY and Co.) is regarded as the head of the trade. If, therefore, his men have accepted the terms offered, the other ironmasters believe that theirs will do the same; and, inasmuch as it is "not the cry, but the flight of a wild duck (says a Chinese author) which leads the flock to fly and to follow," as JEAN PAUL RICHTER has reminded us, then it may be inferred that the individual action of the men at separate works will be practically illustrative of the comparative soundness of views expressed by them in those of their interviews with their masters which have been brought under our notice, and which we have felt much pleasure in reproducing.

THE LECTURES AT THE ROYAL SCHOOL OF MINES.

The conclusion of the somewhat lengthy course of lectures on Mining, delivered by Mr. WARINGTON SMYTH at the Royal School of Mines, notes of which have from time to time appeared in our columns, requires a few valedictory words. Our reports, inadequate as they necessarily were, by want of space and lack of pictorial illustration, cannot fail to have impressed their readers with a sense of the necessity of special training for a pursuit so important and responsible as that of regulating and superintending mining operations. The vast increase which takes place yearly in the consumption of coal increases also the necessity of descending to the lower deposits to meet the growing demand. Greater skill, improved systems, redoubled care, wider applications of mechanical science, become, therefore, every day more indispensable to the security of the lives of workmen and the profitable employment of capital. While the physical difficulties of mining have thus grown upon us, social hindrances have also arisen—regulating wages and hours of work on other grounds than those of supply and demand. Such instruction, therefore, as the School of Mines is so well qualified to supply ought to be equally sought after by all, or on behalf of all, who are to be devoted to the profession of mining engineering. The lecturers are all men of the highest class of ability—the museum and model room are marvels of completeness and variety—the necessity is undisputed and felt; and it is, therefore, with great regret we find that the number of students is not larger than appears to be the case; and that the institution is not more known and more popular amongst the classes it was designed to benefit. This is a subject to which we may again recur. Our object at the present moment is simply to extol the ease and perspicacy of Mr. SMYTH as a lecturer, his familiarity not only with good principles, but the most minute details, and his remarkably extensive acquaintance with the methods, practices, and history of foreign mining.

NEW COAL-CUTTING PATENTS.—Among the applicants for new patents are—Mr. G. E. Donisthorpe, of Leeds, for an invention of "Improvements in apparatus for getting coal and other minerals."—Mr. J. Rothery, of Waterloo Main Colliery, near Leeds, colliery viewer, for an invention of "Improvements in machinery or apparatus for getting and hewing coal, stone, and other minerals, parts of which improvements are applicable to motive-power engines."—Mr. R. Ridley, of Birmingham, engineer, and Mr. J. Rothery, of Waterloo Main Colliery, near Leeds, colliery viewer, for an invention of "Improvements in machinery or apparatus for getting and hewing coal, stone, and other minerals."—All dated April 13, 1868.

MECHANICAL TREATMENT OF ORES, AND THE OBTAINING GOLD AND PRECIOUS STONES FROM ALLUVIAL DEPOSITS.—A very interesting and successful experiment was made on Tuesday, at Messrs. Harvey and Co.'s Foundry Wharf, Nine Elms, with a working model of Mr. Hunt's patent ore-separating and gold-washing machine, on carbonate of copper from Australia, and gold from Canada, in the presence of gentlemen interested in the treatment of ores in both of those countries, as well as other gentlemen connected with English mining. The first trial consisted in mixing a given quantity of gold with sand and gravel; *every particle* of the precious metal was quickly recovered, after the mixture had been put into the machine. The next experiment was the separation of carbonate of copper from matter differing but little from it in its specific gravity; this trial proved the delicate and effectual working of the machine. We are informed that on Tuesday next, at 2 o'clock, a highly interesting trial will be made at the same place, to prove the capability of the machine for separating precious stones from alluvial deposits; various ores will also be treated, the result of which we will endeavour to make known in our next impression.

LIQUID FUEL.—The assertion so confidently made a short time since that the supply of fuel from the coal fields of Great Britain was likely, ere long, to cease entirely, or at least so materially to diminish as to interfere with our commercial prosperity, led to a spasmodic interest in many inventions for generating steam without coal, which, under other circumstances, would have received no attention whatever; the result not unnaturally being the circulation, regardless of their truthfulness or otherwise, of the most absurd statements with regard to the economic value of materials other than coal proposed to be used as a substitute for that now universal fuel. With a view to permit of useful conclusions being formed upon the subject, Dr. B. H. PAUL, F.C.S., read, before the Society of Arts, on Wednesday evening, a most interesting and exhaustive paper "On Liquid Fuel," which has been put most prominently forward as the fuel of the future. Without discussing the merits or demerits of any particular invention, Dr. Paul showed, as will be seen from the abstract of his paper, published in another column of this day's Journal, that under the most favourable circumstances, the cost of doing a given amount of work would be three times as great with liquid fuel as with coal. The advocates of liquid fuel appear to base their calculations upon the use of refuse oil, as that from gas-tar distillers; but Dr. Paul showed that whilst 100,000 tons of cheap oil (the equivalent of 150,000 tons of coal) was the utmost to be hoped for annually, the consumption of coal for steam navigation purposes alone exceeded 10,000,000 tons, so that (liquid fuel-burning requiring distinct arrangements, not applicable when coal is used) the use of oil as fuel for steam-vessels must in any case be restricted to exceptional cases, in which cost is comparatively a matter of secondary importance, and that it cannot be regarded as likely either to revolutionise steam navigation in general, or to call for a total reconstruction of our navy. Captain Selwyn, R.N., in the course of the discussion which followed the reading of the paper, stated that he had been using naphthaline

as fuel at Hackney, and that 23 lbs. (?) of water, at 35 lbs. pressure, were evaporated for every 1 lb. of fuel used. In replying to the remarks made, Dr. Paul said that Prof. Rankine had been cited, but he was quite sure that gentleman would not allow his authority to be brought forward in support of a statement that 1 lb. of any kind of fuel would evaporate 23 lbs. of water. The Chairman (Mr. C. W. Siemens, F.R.S.) expressed his doubts whether the heavy oils, which he considered alone applicable as fuel, would remain at the present low price, and observed that if they had to distil the oil specially for the purpose from coal, it must be expensive, and they must, therefore, fall back upon the natural supplies, or those which were incidental to other manufactures, which supplies must necessarily be limited. The conclusion to be arrived at from Dr. Paul's paper, and the discussion upon it, is that liquid fuel is practically worthless as a substitute for coal, unless in exceptional cases, where cost is of no consideration; and as the subject is one to which he has devoted his best energies, and one upon which he has well earned the reputation of being an authority, that conclusion may very safely be accepted as indisputable.

MINING, METALS, AND MINERALS—PATENT MATTERS.

BY MICHAEL HENRY,

Patent Agent and Adviser, Memb. Soc. Arts, Assoc. Soc. Eng.

Mr. H. GARDNER, of Manchester, has specified a patent relating to Miners' Safety-Lamps. He states that his invention is designed to supply such a fastener or lock to lamps, similar to Davy lamps, for mining purposes, that when they have once been lighted and closed, they cannot again be opened without first destroying the efficacy and utility of the illuminating properties of the lamp. For this purpose Mr. Gardner proposes to apply a tube to receive a wick, or act as a "duct" for feeding the lamp with oil, such tube being separate and detachable from the body of the lamp; it is constructed so as to form a plug or other equivalent stopper, which will prevent the escape of oil when the tube is used in, and forms a portion of, the lamp; and this will also, when screwed to its seating, form a bolt or lock, and prevent the gauze or protecting cover from being removed so long as the lamp is employed as an illuminating medium.

The specifications recently filed include one of a patent taken out by Messrs. J. S. HENDERSON and J. MACINTOSH, of Aberdeen, for the manufacture of metallic cases or canisters, and the machinery or apparatus employed for that purpose. The chief object of their invention is an arrangement of mechanism or apparatus to be used for soldering in or on the ends of metallic cases or canisters, and the body of the canisters themselves. After the cylindrical part of the canister is formed, the bottom is placed either in it or on it, and the cylinder, together with the bottom, are placed upon a revolving platform or stand, which is put in motion either by manual power or other motive agency. The parts to be soldered have a ring of solder placed on or in them, and a heated bolt or jet of flame from a compound or other blow-pipe is brought to bear on the solder or part to be soldered, and the solder, as soon as melted, fills into the spaces lying between the ends and body of the canister, and effectually joins these parts. After the canisters have been filled, the cover is soldered to the body of the canister in a similar manner.

A patent for metal founders' "blacking" has been recently specified by Messrs. F. H. PATTISON and J. WM. H. PATTISON, of Glasgow. This blacking, which is used for coating the inner surfaces of the moulds and cores that receive molten metal, and imparts a fine skin or outer surface to the castings formed therein, is described as being composed mainly, or in the greater part, of anthracite, or "blind" coal, which is known as a coal which emits little or no gas or flame in burning. To this is added a small proportion of fire-clay, wood charcoal (by preference that formed from oak), animal charcoal, or the hard residuary carbon, or coke, obtained from mineral oil in refining stills, which latter is in some cases further calcined, or burnt in close retorts, before being used. These substances are ground to a fine dust or powder, either separately or together. When these carbons have been ground separately they are thoroughly mixed in the proportions desired in a finery, sifting, or bolting machinery.

GAS AS A STEAM GENERATOR.—The great advantages attending the use of gas as a fuel for the generation of steam in places where space is limited, and the motive power is only required occasionally, has been frequently pointed out in the *Mining Journal*, and an improved arrangement has now been devised by Mr. ARTHUR JACKSON, which has been most successfully employed at several city warehouses, wharfs, &c. On Tuesday next an opportunity will be afforded for those interested to ascertain the efficiency of the machine at Mr. Ledger's, Lyons' Wharf, Queenhithe. The advantages which Mr. Jackson claims are economy of space, cleanliness, and safety in particular, the fire offices charging no additional premium for its adoption. In next week's Journal a mechanical description of the invention will be given.

GUN-COTTON, AND ITS SAFETY.—It having been already demonstrated that as an explosive for blasting in mines gun-cotton is unsurpassed, it only remained to prove that no danger attended its storage and transport to secure its very general adoption; and this proof has now been furnished in the report by Mr. JAMES WILSON (of the Goods Manager's office) upon a series of experiments undertaken for the purpose of investigating the risks incurred in the conveyance of compressed gun-cotton charges upon the North-Eastern Railway. The experiments were conducted by Mr. Prentice, of the Gun-Cotton Company, and may be regarded as conclusive. A small box, containing 125 charges (the equivalent of a quarter cask of gunpowder), was ignited with a fuse. When the flame reached the gun-cotton there was a great blaze, like the burning of a heap of loose straw, but no explosion; in less than half a minute there was no flame, except from the burning of the brown paper in which the gun-cotton had been packed inside the box. The box was of wood, about ½ inch thick, and was nailed, but not bound with iron at the corners; it was one of the ordinary packages used for sending the cotton out. Several charges were then laid on the rails near the coal depôts, and coal wagons were run over them: some of them were ignited, others were not. Some of them were placed so that an engine should pass over them: they were all ignited. Mr. Prentice took an axe and chopped one charge into several pieces: there was no explosion or ignition. Small pieces of gun-cotton, placed on the iron rim of a wheel, and sharply struck with a hammer, exploded, or rather detonated. In all the cases where ignition was produced by concussion, whether of a hammer on iron, or the wheels of an engine or wagon on the rails, it was very evident that only so much as was actually struck exploded or detonated, the part not struck firing from the explosion, and burning like so much straw or flax. To prove that they were really dealing with the article which produces such an effect when exploded in close confinement, Mr. Wilson had a hole bored into a large block of hard wood, into which Mr. Prentice placed a charge of gun-cotton, with a fuse attached to it; he then filled up the hole with some broken slate, tightly rammed, and fired the fuse. When the gun-cotton exploded the block of wood was shivered to pieces, each piece being blown several yards away. The results of the experiments were convincing, and enabled Mr. Wilson to report that the railway company might safely carry gun-cotton along with other goods in ordinary wagons, adopting the same rules as now apply to the conveyance of cartridges.

EXPORTS OF RAILWAY IRON.—The year has opened well as regards the shipments of railway iron made to foreign countries and the colonies. The navigations to the North of Europe being closed, the returns of the exports made to Russia and Sweden are all but a blank for the first two months of this year, but very considerable deliveries were made to Feb. 29 to the United States—32,942 tons, as compared with 20,321 tons in the corresponding period of 1867, and 6995 tons in the corresponding period of 1866. British India also took 15,732 tons of our railway iron to Feb. 29 this year, as compared with 11,494 tons to the corresponding date of 1867, and 10,395 tons to the corresponding date of 1866. The total exports of railway iron from the United Kingdom to Feb. 29 this year were 74,853 tons, against 46,326 tons in 1867, and 53,358 tons in 1866 (corresponding periods). When the navigations of the North of Europe are re-opened, Russian deliveries will, no doubt, largely swell this year's figures. It may be added that the value of the railway iron exported to Feb. 29 this year was 585,817*l.*, as compared with 394,197*l.* in the corresponding period of 1867, and 425,480*l.* in the corresponding period of 1866.

REPORT FROM SCOTLAND.

APRIL 15.—The recurrence of certain religious festivals since my last letter has caused a suspension in trade on 'Change, which has only just been resumed. On Monday we had a moderate pig-iron demand, and on Tuesday the prices were a shade better, with shipments to a promising amount, were it not that they were only temporary, and not likely to be repeated for some months to come. With the aid of part of the Canadian exports, our pig-iron shipments from all the Scotch ports for the week just ended amounted to 14,125 tons, against 15,560 tons in the corresponding week of 1867, making a decrease on the total shipments of the year till date of nearly 40,000 tons. To-day there was considerable animation in the market, and from 10,000 to 12,000 tons were sold, at 52s. 4½d. down to 52s. 3d. cash, 52s. 6d. and 52s. 5d. a month, closing with sellers at the lowest prices, buyers 1½d. a ton less. Extensive holders are realising the shipments, and consumption being very disappointing, whilst the stocks are increasing rapidly in makers' hands. No. 1, g.m.b., 52s. 6d.; No. 3, 51s. 3d.; Gartsherrie, 56s. 6d.; Coltness. 57s. 6d.; Langloan, 55s. In Finished Iron the orders—of which many are known to be held *in retentis*—are only brought out sparingly, and each special order is the subject of a special agreement, so that prices are almost nominal, and for bars and rods range from 6*l.* 10s. to 7*l.*, or 2s. 6d. under the list price. Shipbuilding iron is in extra demand, and makers are well off for orders for the greater part of the year. The iron-founders are again busy with architectural, marine, and general castings; but the Pipe Trade is not quite so brisk as it was a few months ago. A fair trade is being done in railway chairs, and brass-founding and copper working are also reviving.

Coals are weak in price, and there was a general scramble among coalmasters to secure a portion of the orders for Canada, which brought prices down to their very lowest, the sales effected merely serving to reduce their "bings" a little, without putting a penny in sellers' pockets. The quantity shipped for the week reached 30,420 tons, against 24,940 tons in the same week of last year. In addition to the colliers in Ayrshire, the colliers in Wishaw proper are working at the reduction of 3s. a day, and before midsummer there is every appearance that 3s., or even 2s. 6d., a day will be the colliers' wage, so much has the value of the article been depreciated by the general dulness of trade. In Fifeshire coalmasters hold stocks of coals amounting to 50,000 tons, and the stocks are accumulating in all the coal districts of Scotland, the short darg having no perceptible effect on the total output. The colliers, in their extremity, have called imploringly on their idols for a help they cannot give, and for a relief they cannot bring. Mr. McDonald is still as active as ever in pressing the case of Mrs. Wilson on the colliers for help. Last week a deputation tried their hand at Gartsherrie and Summerlee, where about 800 miners are employed, and at the former they received the munificent sum of 9d., and at the latter 6d. This is the report of the deputation, and we give it as it is recorded by McDonald himself.

Yesterday, at the Perth Circuit Court, before Lords Cowan and Ardmillan, James Goodall, coalmaster, Woodbine, Fifeshire, and Andrew Wallace, overseer at Cardenden Colliery, were charged with culpable homicide, they having, from neglect of duty, allowed the water from a disused pit to break into No. 6, or the "Wee Pit," whereby William Hunter, James Paden, Patrick Kennedy, and John M'Clusker were drowned, and thus culpably bereaved of life. The Dean of Faculty, who appeared for the prisoners, moved that they be tried separately, which was agreed to. After examining several witnesses, including the Government Inspector, it became apparent that the overseer was not aware of any old waste being near the place where the water broke into the pit. The Crown being satisfied of this, the Advocate-Depute, in a few sentences, stated that he felt that he could consistently ask the jury to return a verdict of not proven, which being done, the prisoner was dismissed, amidst the applause of those present. Mr. Goodall was then placed at the bar, when the Advocate-Depute intimated that he would desert the diet as against him, and he was liberated.

The going colliery of Longlee, on the Hamilton estates, is offered for sale, with machinery and plant; and the engineering and shipbuilding works at Port Glasgow, fued by Kirkpatrick, M'Intyre, and Co.; both eligible investments for capitalists.

The London Steam Collier and Coal Company (Limited) have gained an action in the Court of Session, over Thomas Wingate and Co., shipbuilders, Glasgow, owing to two steam-vessels which they built for pursuers not being according to specification. Damages laid at 10,000*l.*; jury awarded 2000*l.*

In this neighbourhood during the last week or two Trades Unionism has been showing its amenities in overt acts which will scarcely pave the way for its being legalised and protected by Government. While passing along the street the other day a non-Union iron-moulder was deliberately knocked down by one of the locked-out, for which the latter was fined in the sum of 2*l.* 2*s.* Another day an apprentice shipjoiner amused himself during dinner hour by maliciously destroying a jack-plane which belonged to a non-Unionist, who had been employed to do the work of one on strike, and the magistrate rewarded the delinquent by consigning him to a penance of 60 days in prison. Thirteen shipjoiners were sent down by the Free Labour Society, in London, to Greenock, where they were met by a deputation of the locked-out men, and agreed to return south provided their travelling expenses were paid back. This was easily arranged, and they have returned. The masters have a Union, too. Yes; but do they knock down their employees, maliciously destroy tools, or prevent workmen from accepting such terms for their labour as they think proper?

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

APRIL 16.—The question of the reduction of wages over-rides every other in connection with the Iron Trade. On Monday meetings of the men were held at Brierley Hill, Bilston, and West Bromwich, at all of which resolutions were adopted in favour of resisting the reduction. The really important feature of these meetings was that at the one held at Brierley Hill the question was referred to a meeting of delegates, to be held at Stockton on Tuesday, at which it is stated delegates are to attend from Scotland and Wales, as well as from the North of England. The possibility of other districts taking part in the question, and resisting the reduction in South Staffordshire, with a view afterwards to have it set aside where it has been accepted all along formed the only ground for anticipating any resistance. There was, again, a revival of the long-discussed proposal to form a Union, comprising the whole of the iron-making districts in Great Britain. Should the other districts unite to assist the men in South Staffordshire in resisting the reduction they had themselves accepted long ago, the South Staffordshire ironmasters will be sharply punished for not reducing wages when the rest did—first, by paying higher wages for some months, and losing a large part of their trade; and, next, by making them the *vile corpus* on which to make the experiment of a strike. There are, however, reasons to believe that, after all, the strike will not be persisted in. It was stated on 'Change at Wolverhampton on Wednesday that the workmen employed by Mr. W. O. Foster. M.P., had gone in at the reduced rates. This occurring in the Brierley Hill district would be a great discouragement to those who are promoting resistance. Ten of Messrs. Groucutt and Son's puddlers, at the California Works, Bilston, have also agreed to accept the reduced rate of wages.

The failure of another ironmaster has been announced this week, that of Mr. John Wheeley, trading as Messrs. John Wheeley and Co. Some of the pig makers are large creditors.

At Wolverhampton a body, styled the Wolverhampton Trades' Council, has been urging the Chamber of Commerce to appoint for its members half the members of a joint committee, which, with an equal number elected by the Trades Council, should act as a sort of committee of conciliation, or Court of Appeal, in questions relating to disputes between masters and men. The Chamber at first courteously declined the proposal, considering that their constitution in no way fitted them for the performance of such functions. It has, however, been repeated, and the council of the Chamber has returned a very carefully written reply, which, after pointing out various difficulties, one of which is that only members of the trade in which a dispute arose could adjudicate in a dispute about wages, offers to accept the proposal on the conditions that a certain number—one-half being suggested—of the working men on the committee should be fairly chosen to represent the non-Unionists, and that the action of the committee should be limited to general questions, excluding that of the rates of wages, and to such cases of dispute as may be referred to it by masters and men. The difficulty of representing non-Unionists—that, is men unorganised—may prove considerable, but no doubt any such body should be chosen by the whole, or by substantially the whole, of the men interested. Committees from different trades representing the men and the masters in these trades would seem more feasible than one from the very many and various trades included in the hardware manufactures of Wolverhampton, to say nothing of the other trades. Impartiality is very desirable, but knowledge of the subject is quite as necessary.

A banksman, named James Baker, was killed at the Ford Green Colliery, Burslem, by dragging a wagon backwards to the mouth of the pit shaft, when, the cage which covered the mouth of the shaft being raised, he fell to the bottom, and the wagon after him. The coroner's jury returned a verdict of manslaughter against the engineman, William Ball, who was brought up before the magistrates on Tuesday. Ball was blamed, first, for raising the cage at all, as to which he said he heard the cry, "Heave up;" and, next, that he raised it 4 ft. instead of 5 or 6 in., which is all that is necessary to release the cage, so as to enable it to descend. Mr. Coe, the manager, said the conduct of the deceased in dragging the wagon after him to the mouth of the shaft was most imprudent. He also stated that the cage, being empty, would rise higher than if full, and it was proved that the defendant turned on the steam very slightly to raise the cage. The hearing was adjourned for the production of a boy who, it was said, heard the signal, "Heave up." It was stated that the engine-house was twenty yards from the pit's mouth. It certainly seems desirable, with such a distance, that some means of communication less vague than a shout should be adopted.

REPORT FROM MONMOUTH AND SOUTH WALES.

APRIL 16.—Operations at the ironworks have been somewhat retarded, owing to the holidays, but something like regularity now again prevails at the various establishments in the district. Reports continue of a cheering and hopeful character, and at two or three of the leading works there is more activity than for some months past. The men, also, are working fuller time, and it is generally believed that a like satisfactory state of things will be witnessed at all the works in South Wales before many months have elapsed. Makers evince no anxiety to enter into heavy contracts, as they feel convinced that present rates will shortly advance, and that by so doing they would be debarred from participating in any benefit that arose. On home account there is little alteration, but the change is towards improvement. The railway companies are undoubtedly exercising more freedom in their purchases, and the increased confidence evinced by the public in railway securities is an indication that contracts for considerable quantities will shortly be forthcoming. Advices from the foreign markets are more satisfactory than for some time past, and give hopes of a considerable increase in the demand. Large quantities of rails are being shipped to the United States, and orders are gradually increasing. Vessels are now wanted to convey iron from Newport and Cardiff to the British colonies, United States, Brazil, and Russian markets at rates that will leave some margin for a profit. Enquiries from the United States and Russian markets are increasing, and to the latter the clearances this season, if anticipations are realised, will show a considerable increase over that of the past. Pig-iron commands a fair sale, and stocks are being gradually reduced. The Tin-Plate Trade is in a more satisfactory position than it has been for some weeks past, and makers obtain list prices without any difficulty.

Greater vitality is being evinced in the Steam Coal Trade, and merchants and shippers have a number of orders on their books, principally for the East and French markets. The weather continues fine, and arrivals and clearances are speedily made. Eleven weeks have now elapsed since the dispute between masters and men began in the Monmouthshire district, and there are no more signs of a termination of the strike than at its commencement. At Abercarne the men are evidently inclined to make terms with the masters; but, owing to the enormous loss sustained, the latter will not agree to any concessions whatever. The application made to the district magistrates for warrants of ejectment, and to take possession of tenements in the occupation of several of the men on strike, have been withdrawn, and Mr. Bradgate, who appeared for the defendants, stated that if the company would grant the men their discharge he would undertake they would give up possession, and waive all legal points. Whether the Ebbw Vale Company will accede to this request has yet to be seen; but it is not unlikely they will do so, as they have applied for a copy of the form of discharge the men require. In the eastern valleys it is believed that, although the men have given notice to leave unless the old rate of wages be paid, they will not bring out their tools if their request is not complied with. At several of the collieries in Glamorganshire the men have also given notice to leave unless their wages are advanced 20 per cent.; but the general impression is that no strike will take place.

Two men, father and son, named Jones, have been rather badly burnt in Mr. Powell's colliery, Llantwit. The men drove into an old working, and as naked lights were used the sudden influx of gas caused an explosion.

An important colliery case was heard at Aberdare on Tuesday, Thomas Davies, manager of the Merthyr and Aberdare Steam Coal Company (Limited) being summoned for infringing the 10th section of the Mines Inspection Act. Mr. Simons appeared for the Government Inspector (Mr. Wales), and Mr. Linton for the defendant. John Griffiths, overman in the Four-feet level in the above colliery, said the level was 700 or 800 yards long, and was worked by a stationary engine. A boy, named William James, was killed in the level on Jan. 18 last. The boy ran to meet the trams, and was killed. There were no holes or refuges in the sides of the level to run into out of any danger. The men had to go in that way to work. Some went in trams and others walked. There was a space of from 18 in. to 5 ft. from the rails to the sides of the level. There had been no other accident in it. He had stood in the level numbers of times while the trams had passed. Every 20 yards there was room for a man to stand safely. Mr. Wales, Government Inspector of Mines, said he had examined the level after the accident, and found no place of refuge, as required by the Act. Some old headings were left open, about six in number, whereas there should be refuges every 20 yards. Believed several places were not 18 in. wide, clear of the rails. If the trams went off the rails just where the boy was killed there were no means of escaping the danger for a distance of 100 yards. There ought to be places for five or six persons to get in at every 20 yards. He thought the coal on trams would project at least 7 in. on each side. A man may stand safely in 2 ft. 4 in. clear of everything. A man was at work within 25 yards at the time the boy was killed, and might have been killed too, but the tram stopped before it reached him. No amount of margin without refuges would meet the requirements of the Act of Parliament. Sometimes a whole tram got off the line, and then there were no means of escaping if there were no refuges large enough for men to get in. Mr. Linton contended that the Act did not necessarily require holes should be made if there was sufficient margin for men to stand in safety. In the level in question there was no length of 20 yards without a spot where safety could be found. He called David Thomas, mineral agent, who thought 15 in. clear of the axle sufficient space for a man to stand in safety. In the level in question there was no length of 20 yards without 19 in. space on one side or other of the rails. Mr. Batson, mining engineer in Powell's Duffryn Colliery, put the engine in that worked this level, and had walked up and down the level continually after without experiencing danger. Mr. Fowler, the magistrate, said there was not a shadow of a doubt, so plainly was the meaning of the Act, that no margin or footpath would be sufficient. There must be regularly-constructed refuges, and he was surprised to hear mining gentlemen reasoning to the contrary. He should inflict the mitigated penalty of 10*l.*, including the costs.

The cutting of the first sod of the Alexandra Docks, at Newport, will take place at an early date, and immediately after the return of Mr. Abernethy, the engineer, from Egypt, which is expected to be in two or three weeks. The presence of Mr. George Elliott, Mr. Ralph Elliott, and Mr. McLean on the directorate, is looked at as being highly favourable to the future success of the docks, as there is no doubt a very considerable quantity of steam coal from the Aberdare Valley will be sent to Newport for shipment.

"A Merchant" writes—"The other day I tendered for 26,000 tons of iron rails to a foreign Government, and although my tender was the lowest of about 20 from Wales and the Northern district, the order was given to a Belgian maker, at a price of 15s. per ton below my offer. As Belgian rails are to a great extent manufactured from English pig-iron, of which thousands of tons are annually imported from Middlesborough and Newcastle for that purpose, something must evidently be wrong, and unless the question is thoroughly sifted, one of the most important trades of this country will gradually decline, and with it the position of both masters and men."

The arrivals at Swansea include—L'Actif, from Redan, with 50 tons of pitwood, for Llynvi Valley Iron Company; Idag, from Skien, with 1025 spars, 212 deals, 584 battens, and 717 pieces of timber, to order; Marie Adele, from Bilboa, with 80 tons of lead ore and 59 tons of zinc ore, to order; Orian, from Cherbourg, with 180 tons of iron ore, for R. Crawshay; Albert Abbeville, from Passages, with 1291 sacks of copper ore, for H. Bath and Son; Sprite of the Plym, from Alicante, with 108 tons of Esparto grass, to order, 100 tons of minerals, to order, and 2550 dols. of gold, for James King.

SOUTH WALES INSTITUTE OF ENGINEERS.—The general meeting of the members of this Institute was held at Cardiff, on Wednesday, when the following papers were read:—"On Davies' Self-acting Steam-Striker," by Mr. D. Davies; "On Over-winding, and how to Prevent it," by Mr. W. Fairley; and "On the Assurance of the Lives of Miners and Colliers," by Mr. Christopher James. The members afterwards dined together at the Royal Hotel, at which the usual loyal and complimentary toasts were proposed and responded to.—[A full report of the proceedings will appear in next week's Journal.]

SWANSEA HARBOUR—THE OBSTACLES TO THE COAL TRAFFIC.—The trustees to the Swansea Harbour met on Monday, under the presidency of Mr. Starling Benson, when the month's returns of the port showed the trade to be depressed, with a considerable falling off in every respect as compared with the corresponding period of 1867. A discussion of some length took place in reference to the subject referred to in last week's *Mining Journal*—the obstacles which the merchants and freighters have to contend with in the transit and shipment of coal from the Aberdare and Merthyr districts. This discussion arose consequent upon a recommendation made by the executive committee that the passenger station upon the Swansea Harbour Railway should be removed. The committee based their recommendation upon the fact that the railway company dispute the ownership of the trustees to the ground upon which the station is built, but Mr. George B. Strick, Mr. Alfred Sterry (both colliery proprietors and large shippers in the port), and Mr. J. W. James, the general superintendent of the harbour, in supporting the recommendation of the committee, said that there were other reasons, and of more vital consequences to the trade of the port, why the station should be removed. The harbour railway had been constructed by the trustees for the sole purpose of accommodating the coal traffic from Aberdare and Merthyr in the south docks, and to facilitate the shipment of coal from the whole of the surrounding districts. When that line was constructed it was never thought for a moment that a passenger station would be placed on the line so as to intercept the mineral traffic; but the amalgamation

f the various railways had brought about such a result, one most prejudicial to the coal trade of the port.—Mr. Strick said passenger trains were formed, either on the arrival or departure, ten times per day, and the mineral traffic being suspended at least half an hour, each train made a delay of five hours per day.—Mr. James said that one of the largest freighters in the port had told him that the delays consequent upon the mineral traffic being worked over the harbour bridges, and the interception of the traffic by the passenger station, amounted to no less than seven hours per day.—Mr. Strick said he had been informed by one of the largest colliery proprietors of the South Wales district that the obstacles which existed in the transit of coal to and shipment at the port of Swansea were so great that he was compelled to send round almost the whole of his coal for shipment at Cardiff.—Mr. Sterry said the obstacles which existed in the shipment of coal in the port of Swansea were so great that within the past week Mr. Joshua Williams, the general manager of the South Wales section of the Great Western Railway, had sent down an official to make arrangements for a general conference of the shippers of the port and Mr. J. W. James, the superintendent of the harbour; and he believed that there was not one freighter in the port but would acknowledge that the delays which occurred in consequence of the railway traffic being so frequently impeded were acting most prejudicially, not only to the port, but to the colliery proprietors of the surrounding districts.—After a good deal of discussion to the same effect, the resolution of the executive committee for the removal of the station, or rather authorising the clerk to take legal steps to recover possession of the land upon which such station is built, was carried, with only two dissentients. We are glad to see that the trustees, as the conservators of the interests of the port, are now alive to the necessity of removing the obstacles which exist to the development of the coal trade of the South Wales district. With the removal of the station one great cause of delay would cease to exist, but there are others equally serious to which the attention of the trustees and the freighters should be at once directed.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

APRIL 16.—The demand for most qualities of Iron remains dull, although the furnaces from Eckington to the southern part of Derbyshire continue generally in full operation. There are, however, indications of a better state of things, so that the quietness which has so long prevailed, it is expected, will give way to a season of comparative activity. In Coal there is little or no alteration, and the business doing to the South is by no means large, and the returns are far from favourable, so far as the London trade is concerned. Seeing that the Yorkshire coalmasters are doing very little, the contracts about to be entered into for the supply of gas coal, and those for locomotive purposes, will have to be reduced from last year's rates. There is very little improvement to be noted in the business doing in Sheffield, the heavy steel railway material and armour-plates alone showing anything like activity. The ironworks in the neighbourhood are doing rather more, whilst a better feeling as to the future prevails. At Milton and Elsecar there is plenty of work, and there is every appearance that those extensive works have once more resumed that state of activity which formerly characterised them, even in seasons when the trade generally was depressed. The rail mill is constantly going, and, in fact, every department appears to be in a prosperous state, there being some large orders in hand for various qualities of iron, both for home consumption and for exportation. During the week a cargo of sheets and angle iron has been forwarded to Goole by water for shipment at London for Turkey. Indeed, there is every probability that the Sultan, profiting by his visit to England, will be the means of creating a considerable trade in various qualities of iron with this country. We may also expect from the same quarter some large orders for rails, seeing that several lines are already projected. The steel works at Penistone (Cammell and Co., Limited) have been standing during the week, owing to stock taking, but business will be resumed on Monday, there being a fair order in hand for Bessemer rails.

There is no material improvement in the demand for coal, and the tonnage being forwarded to London shows but little improvement. The testimonial sent to the directors of the Great Northern, asking for a reduction of the present rate to the metropolis, has as yet elicited no response, and the coalmasters naturally feel much annoyed at the apparent inattention shown to their appeal, more especially as the question is one in which the company itself is deeply interested. To Grimsby there is rather more doing in "hards," and also to Hull, from the neighbourhood of Elsecar, causing a slight improvement in the freight of keels. A moderate tonnage is being forwarded to the iron and railway carriage works in Lancashire, as well as to the cotton mills, by the Manchester, Sheffield, and Lincolnshire line of railway.

There is some prospect of a new coal field being opened out a few miles distant from Barnsley, at a place called Royston. For some years past several of the principal landowners have been desirous of developing the minerals of the district, but as the lands were intersected by a number of small holders there has been considerable difficulty in getting all to agree to have the coal opened out. Matters of late, however, have so far progressed that there is now every appearance of the district being tapped, and becoming an important centre in the district, seeing that it is very advantageously situated, being close to the railway and canal.

During the week, although very little work was done at the South Yorkshire collieries in the early part of it, the proposed reduction of wages to the extent of 5 per cent. has been freely discussed. On Tuesday a deputation from the men waited by request on the managers of the Wharncliffe Silkstone Colliery, when the matter was gone into. On Wednesday and to-day at other collieries the men will also meet their employers on the subject. In all cases the men had appealed to the executive as to the course they were to adopt, and the various deputations informed the employers and their representatives that they would make known their wishes to the body of their fellow-workmen, but some time would elapse before an answer could be given. The question will be decided by the delegates and the Executive of the Miners' Association, for which purpose a special meeting has been convened for Monday next. It may be stated that many of the men are strongly opposed to the reduction, but the older and steady men are not so disposed. It is not expected that there will be any interruption whatever to the trade, but that the reduction will be accepted.

INVENTIONS CONNECTED WITH THE IRON TRADE.

In noticing the North of England Iron Trade quarterly meeting, in last week's Journal, our local Correspondent referred to the different specimens of steel from Cleveland iron, also to various inventions exhibited, and we now append some more detailed particulars of the latter, as given in the "Iron Trade Review:"—

Messrs. HAWKSLEY, WILD, and Co., Brightside Boiler Works, Sheffield, exhibited drawings and model of their patent combined furnace and boiler, the great novelty of which is in the furnaces for puddling ball, bar, tyre, and mill, furnaces being built inside the flue of the steam-boiler which acts as a watertight jacket or case for the brickwork, keeping it in its proper position, and by preventing its giving way makes it last two or three times longer than the plain furnace. The fire grate and furnace occupy about one-half the length of the boiler flue, beyond which the flue is reduced by their patent flange, and cross tubes are inserted to absorb the waste heat of the furnace. In this case the boiler flue acts as the neck of the furnace, thereby saving the constant repairs and loss of time. They have had these patent combined boilers and furnaces at work fifteen months, six having been put down at one works, all of which are said to be giving satisfaction. They are at work night and day, as ball and forge furnaces. They also exhibited drawings and model of their patent flanged and combustion chambered flued boilers, with cross tubes. In this boiler the flues are made of two diameters, one ring of plates being 4 in. less in diameter than the other, the smaller ring of plates being flanged outwards, thereby getting a cross section of iron through the flange, which is a sit or stay round the flue, preventing its collapsing under high pressure. This flange is likewise an expansion joint, allowing the flues to expand or contract without straining the ends or shell of the boiler. In the smaller rings are inserted the vertical and diagonal tubes, all of which are put in after the flue is rivetted up; therefore, any one can be taken out and replaced at any time. The larger rings act as combustion or heat-retaining chambers, where the gases are mixed, the smoke is consumed, and the heat retained. With this irregular surface of flues it is not possible for any portion of the flame to pass through without coming in contact with the heating furnace, thereby saving a great amount in fuel. They have had these boilers at work for six years without requiring repairs. They can be put down for the same cost per horse power as the plain cylindrical boilers, and result in a saving of 25 per cent. in fuel.

Mr. SAMUEL RICHARDSON, Darlington, exhibited compressed charges of gun-cotton, for mining and quarrying purposes. As a material for blasting purposes gun-cotton is now rapidly rising in favour, and owing to the improvements introduced by Prof. Abel the material can be used with certainty, safety, and facility. A charge of any given size exerts six times the explosive force of gunpowder; and as it produces no smoke the work of mining can be carried on more rapidly than when gunpowder is used. The cotton in question was manufactured by Messrs. T. Prentice and Co., Stowmarket.

KIRK'S PATENT EQUILIBRIUM ROLLING MILL was exhibited by Messrs. Kirk and Valentine, Derwent Rolling Mills, Workington. The advantages claimed for Kirk's Equilibrium Rolling Mill are that, by its adoption, plates, rails, girders, bars, and difficult sections, and long lengths of iron and steel, may be rolled far more easily and economically than by any existing plan. Three-high mills can be worked with less friction than ordinary two-high mills; and the great first cost and continued expense of the reversing systems is obviated. As the rolls can be run at any desired speed, and the iron or steel worked with great rapidity, the productive capabilities of the mill are largely increased, the necessity of wash-heating is in most cases done away with, and as much more work can be placed on the metal the quality is, therefore, greatly improved. Rails may easily be made in twice the usual lengths. Plates can be rolled in longer lengths than at present, and thus the waste in shearing is materially reduced. Large slabs and broad flat bars can be worked in one or two holes, and by taking advantage of the double squeeze in the roughing rolls, fewer rolls are required. The rolls may be made shorter than usual, and a greater degree of strength obtained. Much less skill is required in setting and keeping the rolls in order, and the manufacturer is, therefore, less dependent on the caprice of the workman. In this arrangement, the bearings of the middle roll are stationery and the thickness of the metal is regulated by moving the top and bottom rolls to and from the middle one, which is kept exactly in line with the driving shaft. The top roll does not rest upon the neck of the middle one, as has hitherto invariably been the case in three-high mills, and thus the great friction, springing of the rolls, and excessive wear and tear attending the use of these mills is entirely avoided. The top and bottom rolls counterbalance each other by means of levers and rods. The use of liners is dispensed with, and the top and bottom rolls are adjusted to the middle roll instantaneously. The side brasses of the middle roll, and the top and bottom chocks are adjusted by means of a wedge with screw attached. The wedge setting-screw enables the workman to fix the rolls in any desired position, endways or sideways, at once, without the aid of liners or side screws. The guards are fixed to the middle roll in such a manner as to cause them to be double-acting; each serving as false guard for the other. The tendency of the metal to collar is thus greatly reduced, and this arrangement allows the top and bottom rolls to move to and from the middle one without interfering with the guards. For heavy work, a lift is used to raise the hot metal from the bottom to the top roll, and also to receive and lower the metal from the top to the bottom roll. The lift recommended is worked by a youth, by means of a lever with an adjustable weight. The weight balances the lift and hot metal without the aid of steam or hydraulic power, and thus the heaviest masses can be rapidly and steadily raised or lowered without the costly appliances now in vogue. Labour is economised, and the tables move in such a manner that the hot metal is placed in the rolls by the action of the lift. This invention is particularly applicable to small guide and merchant mills running at quick speed. The friction is greatly reduced, and the wear and tear of brasses and rolls lessened.

WRIGHTSON'S IMPROVED HYDRAULIC BRAKE FOR LOWERING FURNACE BELLS.—This new arrangement for lowering the bells of furnaces has recently been successfully applied by Messrs. Head, Wrightson, and Co., of Stockton-on-Tees, to the furnaces of Messrs. B. Sanderson and Co., Newport. The usual method of lowering bells is by a winch gearing at the end of the beam supporting the bell. This is complicated, liable to get out of order, and requires one man, and frequently two men, to work it safely. In the improved arrangement a small hydraulic cylinder is placed under the beam. In this cylinder a piston works vertically, and is attached to the end of the beam by a connecting rod. A water passage connects the top with the bottom of the cylinder, and a cock placed midway in this passage regulates the flow of water from the top to bottom side of piston. When the bell is required to be lowered this cock is opened, and as the water flows from the top to bottom of the piston the bell descends as gradually as the attendant (who may be a boy) may think proper. He can stop it by shutting the cock in any part of its stroke, and the bell is brought back again to its position when the charge is off by the heavy balance-weight at the end of the beam. The advantages claimed for this system are simplicity of parts, small liability to get out of order, and the small cost at which it may be applied to existing bells.

THE HYDRO-PNEUMATIC HOIST FOR BLAST-FURNACES.—This hoist, recently patented by Mr. Wrightson, of the firm of Head, Wrightson, and Co., of Stockton, conjointly with Mr. Walter Crooke, of the same place, is worked, as the name implies, by a power derived by the joint action of water and air, and is a simple application of the laws of buoyancy. The action may be explained as follows:—A weight has to be lifted a certain height; the simplest way to do this mechanically is to attach a drum to the cage containing the weight to be lifted, pass it over a sheave, and at the other end of the chain hang a weight exceeding the weight to be lifted. This will, of course, lift the cage, but then comes the mechanical difficulty how to lift again the balance-weight. To accomplish this in the hydro-pneumatic hoist the balance-weight is made in the form of a bell, and allowed to work up and down in a tube filled with water. To raise the bell a valve is opened which admits air to the under side of the bell; this air bubbles up into the top of the bell, displacing a sufficient amount of water to give the required buoyancy: the bell then rises; when at the top the air is let out, on which the balance-weigh sinks again. In the application of this hoist to blast-furnaces, a wrought-iron tube, 5 or 6 ft. diameter, is erected vertically, upon or near the air accumulator, a pipe from the tube passing down to within 3 or 4 in. of the bottom of the accumulator; the tube is carried up 10 or 12 ft., and another tank of similar dimensions to the accumulator is placed on the top of this tube. The tube is filled with water, and in the tube is a balance-weight, formed like a bell, and is of such weight (when weighed in water) as to exceed the heaviest load the hoist is required to raise, and the hollow within it is of such capacity that, when filled with air, it will attain the same power of buoyancy upwards that it possessed of sinking power when filled with water. One rope or chain is attached to the top of the bell and over another sheave on the top tank, and decends to the other cage. By this arrangement the cages on the movement of the bell work in opposite directions up and down. The bottom tank is connected with a small air-engine, which, on pumping air, forces the water in the lower tank up the tube until the surface of the water comes within 6 in. of the bottom, when the air-engine is throttled by self-acting apparatus. The lower tank thus forms an accumulator of compressed air. By a suitable valve sufficient of this air is admitted into the bell to displace the proper weight of water; the bell rises, drawing up one cage and letting down the other. When it is required to let the bell down a small valve opening internally at the top of the bell is pressed by a lever, the air escapes, the water re-enters, and the bell resumes its functions as a balance-weight, and in descending draws up one cage and lowers the other. The arrangement for brakcage is on this principle. The bell must have sufficient clearance at its sides to allow the water to pass in its motion up and down; by gradually contracting the area of water passage near the top and bottom of the tube the bell is brought to a gradual stand, and by this means the speed at different parts of the lift can be regulated to the greatest nicety. The hoist can also be made to lift the cage through twice the space traversed by the bell, by a simple arrangement of sheaves and chains. Under some circumstances this would be a great advantage. The principal advantages claimed by the patentees are—1st, economised working; 2d, simplicity of parts: 3d, ease of repair; 4th, cheapness of first cost. A hoist upon this principle has lately been erected by Messrs. Head, Wrightson and Co., at the Rosedale Iron Company's works at Ferryhill, for raising pig-iron to the cupola stages. The working has been in every respect successful.

Mr. CHARLES WHILE, of Newport, Monmouthshire, exhibited two models of a patent rolling mill invented by himself. His system consists in the use of several pairs of rolls combined in one mill, some of the rolls being vertical and others horizontal, and so arranged that the bloom is compressed alternately flatways and edgeways, through as many pairs of rolls as may be required for reducing the iron to its proper size. By this principle manual labour is altogether done away with, excepting a man to throw the pile into the first pair, and another to take the bloom or bar away. One important feature of this process is that the iron is allowed little time to cool; and the quantity of work of which the mills are capable will be best learned from the fact that the Aberdale Company are making from 90 to 100 tons of iron, in twelve hours, from one mill.

Mr. THOMAS WHITWELL, Stockton, exhibited a model of his patent hot blast stove, which is constructed of fire-brick, and is so arranged as to combine great efficiency with simplicity of parts. The stoves are worked in pairs, on the regenerative principle. The heated furnace gases pass through one stove for a certain period, until the fire-brick flues are thoroughly heated, after which the blast is made to traverse the heated chambers, the corresponding stove being in the meantime subjected to the action of the furnace gases. These stoves also admit of being cleaned out without interfering with the working of the furnaces. The heat of the blast is raised to a higher temperature than is practicable under the arrangement frequently adopted. The invention has been in successful operation for above a year, at the Thornaby Ironworks, Stockton.

Messrs. W. PETCHELL and Co., Middlesborough, brought under the notice of the trade the patent portable fire-engine, L'Extincteur, an appliance specially suitable for keeping in offices ready for an emergency. Each apparatus shown was capable of containing 26 pints of water and 208 pints of carbonic acid gas.

Mr. LEDWARD, of Middlesborough, had specimens of Gauntlett's Patent Registering Pyrometer, and also specimens of the pyrometer for ordinary blast-furnace use. These inventions have been before the trade for some time, and are generally appreciated.

THE MINERAL RESOURCES OF ITALY.

In bringing the mineral riches of the kingdom of Italy to the notice of the British public, with a view to their commercial development, probably no one has laboured so indefatigably as our esteemed correspondent, Mr. W. P. JERVIS, now Conservator of the Royal Italian Industrial Museum at Turin; and in the very complete and interesting volume* which he has now issued he has certainly afforded still further evidence of his zeal in promoting the welfare of the Italian industrial interests. The marbles and alabasters, of course, take a prominent position in connection with Italian minerals, but Mr. JERVIS likewise shows that the serpentine and allied eruptive rocks, boracic acid lagoons, rock salt, iron, copper, lead, silver, mercury, antimony, and manganese, as well as various other metalliferous minerals, and mineral fuel and oils, exist in quantities which would amply repay the man of business who might turn his attention to them. The magnificent white marbles of Carrara, Massa, Seravezza, and elsewhere in the Apuan Alps, are carefully described, and Mr. JERVIS observes that an efficient mode of sawing blocks of marble *in situ* is much to be desired. The extensive use of gunpowder is wholly unsuited to the getting out of the stone, as the rock is already frequently much shattered. Hitherto it has been the custom to extract the marble only at or near the surface, but Mr. JERVIS doubts whether the white kinds would not be obtained better by cavern workings, by which means it would be far less exposed to the action of the atmosphere and variations of temperature, which must considerably augment the tendency to shiver, water enlarging and extending almost imperceptible flaws as it freezes in winter, or evaporates in summer.

The Royal Salt Works of Volterra (Pisa) are the most important in Central Italy; they are about 40 miles from Leghorn. Unlike the well-known salt deposits of Cheshire, Prussian Saxony, &c., which belong to the Triassic formation, the rock salt of Volterra occurs in beds varying from 15 to 40 feet thick, in ash-grey miocene, or middle tertiary clays. The method of manufacturing salt at these works has undergone considerable change and improvement during this century. Until very recently four pans were enough to supply the demand for the whole of Tuscany, but as the price of the salt has been reduced very considerably of late years the consumption has increased, and they are no longer adequate to the purpose. The chapter on the Elban Iron Mines is particularly interesting, whether regarded from a scientific or a commercial point of view. Follonica, where the Elban iron is principally smelted, is a village on the coast, exactly facing Rio, from which it is fifteen miles distant, and ten from Massa Marittima. These are the most important ironworks in Italy. There are three blast-furnaces, each capable of containing about 6 tons of ore. The charge is—specular iron, 350 lbs.; dense charcoal, 440 lbs. A hot-blast of 430° Fah. is employed. Ninety charges are added daily. They produce from 6¾ to 8½ tons daily, the ore yielding from 55 to 58 per cent. of iron. The furnaces are tapped every four hours. In the Italian Exhibition at Florence the greatest novelty connected with the iron from Follonica was the manganiferous pig-iron, containing 5 per cent. of manganese. This remarkable product, very analogous to the German spiegeleisen, presents beautiful crystalline fractures, the faces being 2 or 2½ inches across. In the manufacture of bar-iron, Mr. PONSARD has now begun to employ the tertiary lignite of Montebamboli for the puddling furnaces, where the metal not being in contact with the fuel the sulphur it contains is not detrimental; but wood charcoal has to be employed for the fusion of the ores, as heretofore. Great improvements have lately been made at these works, and pig-iron is now produced much below the price at which it can be imported from England.

Copper occurs in Central Italy as veins in sedimentary rocks, accompanied by quartz gangue, and associated with other ores, as in Cornwall; in amphibole or pyroxene, a metamorphosed rock; and in serpentine, without diallage or gabbro rosso. The total expenses incurred at Capanne Vecchie, the cost of raising and smelting of ore to yield 1 cwt. of rosette copper is 2*l.* 17*s.* 6*d.* An analysis of this copper gave—Copper, 90·50; iron, 0·02; silver, 0·10; suboxide of copper, 0·30=99·92. The presence of suboxide is intentional, and gives the rosette copper that beautiful colour whence it derives its name; it is simply the result of prolonged refining. The purple ore from the Monte Catini Mine, which is in the serpentine, gives, according to an analysis of BERTHIER, 67¼ per cent. of copper, and the iron pyrites from the same mine upwards of 32 per cent., the percentage of copper, iron, and sulphur in the latter ore being, according to the analysis of LE BLANC, as near as may be equal. Lead has been worked from time immemorial in Tuscany, and Mr. JERVIS refers to the enormous quantities of ancient lead slag found round the Argentiera, at Montieri, containing 4 per cent. of lead, and about ¾ oz. of silver to the ton of ore. The mines of Monte del Argentiera were worked in the latter part of the sixteenth century, and were re-opened about 15 years ago, but have since been suspended, much mystery and secrecy being maintained respecting them. A very complex and valuable grey copper from Angina, Val di Castello, analysed by KERSTEN, gave—Iron, 1·80; copper, 35·80; antimony, 27·47; silver, 0·33; zinc, 6·05; mercury, 2·70; and sulphur, 24·00=98·24. An analysis of lead from the Tambura Mine contained 62·08 per cent. of lead, and 9·50 per cent. of sulphur.

Silver is only found in Central Italy in combination with other ores; the copper, lead, and zinc ores occurring in sedimentary rocks often contain a considerable quantity of silver, but BECHI has pointed out the peculiar circumstance that the copper in serpentine is entirely free from that metal. At least four mines of cinnabar exist in Tuscany, but only one of them is in operation just now. Selvena Mine was re-opened in 1849, and is at present the property of Messrs. SADUN and ROSELLI. The annual production is 3½ tons, which are smelted at the works of Modigliana. The few remaining mines are of much less industrial importance. Antimony is found at Pereta, in the Maremme, not far from Grosseto, in long crystals of great beauty, affording some of the finest specimens in the world. Manganese occurs in several parts of Tuscany. Useful as is this mineral in the manufacture of bleaching powder, &c., its extraction in Italy as a source of wealth is still, Mr. JERVIS thinks, an open question, but one well deserving attention. Arsenic might be procured from pyrites in the vicinity of Pietrasanta. Cobalt appears to exist near Seravezza, for Mr. ANGERSTEIN, a Swedish mining engineer, found in 1751 a vein near Santa Anna, in the Val di Castello.

Italy possessing, as she does, such vast mineral resources, it becomes an object of great importance to know whether it is desirable to smelt the ores at home or sell them to foreign capitalists. As regards the use of charcoal in smelting works, it would be very unwise to manufacture it on a large scale, as it would involve the cutting down of the forests; the more so since the mountainous region of Italy is so subject to violent rains that wherever the country is stripped of trees all the soil is washed away, rendering the place quite useless for agricultural purposes; and mountain torrents are formed which swell almost instantaneously, carrying away bridges, and devasting the fertile fields towards the plains. Italy does not possess any true coal, except in the Alps and the Island of Sardinia, and even there only in very insignificant quantities. Tertiary lignite, on the other hand, occurs in numerous places in Italy, and is often of the best quality to be procured in the world, but the basins in which it is found are very small and insignificant, so that in the course of 20 or 30 years of active working the largest of them might be worked out. The best lignite in Central Italy is that of Montebamboli, which was opened in 1839, and has been rather extensively worked for many years. It furnishes black lignite, of so bituminous a nature as to be difficult to distinguish from Newcastle coal; it produces excellent coke, and an abundance of gaseous matter, so that it is suited for a variety of purposes, such as for metallurgical and gas works, and for steam-vessels. It has been admitted on the French Navy List, and Mr. PONSARD has within the last two years made use of it with success for his puddling-furnaces at Follonica; but the sulphur it contains renders it unfit for smelting the iron ore.

Petroleum is found in numerous places in Italy, especially in the Appenines. In general it issues between the pleiocene and pleistocene strata, and is procured by digging wells, where it floats at the surface of the water, from whence it is removed from time to time. Such artificial pits exist at Montechiaro, near Placenza; Amiano and Fornovo, near Parma; and Monte Zibio, Monte Festino, and Monte Bonello, near Modena. BRUGNATELLI estimates the quantity which might be daily procured at Amiano at 1500 lbs. At Pietramala (Florence), on the southern slope of the Appenines, and close to the road from Bologna to Florence, there is a naphtha spring, known as the Vulcano, whence flames issue constantly, and may be seen distinctly at night. The bituminous calcareous tufa at Querceto gave BECHI on distillation 4 per cent. of oil, whence naphtha could be procured by re-distillation. Although mineral fuel may not be abundant in Italy, Mr. JERVIS suggests that it merely renders it the more necessary for her to encourage foreign trade in those commodities which, like fuel, she does not possess in exchange for such as she exports.

Mr. JERVIS'S book will, undoubtedly, prove very valuable to all interested in Italian industrial enterprise; it contains a vast amount of useful and reliable information, and as it has not been written with a view to promote the views of individuals, or to direct undue attention to any particular property, it has the great advantage of being free from exaggerated statements throughout. It is illustrated by a number of original engravings, which, with elaborate statistics, upon the compilation of which no trouble seems to have been spared, give it an additional recommendation.

PETROLEUM IN ITALY.—In the Supplement to the *Mining Journal* of March 28 public attention was called to an interesting treatise on this subject, issued (through Messrs. E. and F. N. Spon, of Charing Cross) under the title of "The Petroleum Zones of Italy," by Mr. H. ST. JOHN FAIRMAN, F.G.S. The perusal of this little volume will amply repay the reader, as it contains data on the different petroleum-yielding lands of the Italian territory, which are carefully marked out on a map published in the appendix. It contains, also, an official report, published by the Industrial Commission of Florence, addressed to the Minister of Agriculture, Industry, and Commerce, President of the Italian Commission at the Paris Exhibition of 1867, where Mr. Fairman received honourable mention for his specimens of Italian petroleum. The existence of petroleum in Italy, of good quality and presumable large quantities, is now declared to be a recognised fact beyond contradiction. The Italian Government is fully convinced of the importance of the question to Italy. It has spared no means to have the matter investigated and reported upon by special commissions appointed for that purpose. It is anxious that Italy should follow the example of America in opening out this source of national wealth, believing that equally brilliant results will attend the efforts of those who shall devote attention and capital as pioneers in Italy on its petroleum fields as those obtained by the pioneers in Pennsylvania, Venango county, and other parts of America. The King of Italy, acknowledg-

* "The Mineral Resources of Central Italy: including Geological, Historical, and Commercial Notices," &c. By W. P. JERVIS, Chevalier St. M. and L., &c. London: STANFORD, Charing-cross.

ing the merits of Mr. Fairman, has awarded him, on several occasions, honourable proofs of his appreciation of his labours and praiseworthy efforts to call public attention to this subject. Already several companies have been formed to work sections of the Italian petroleum zones, and others are now considering the question, and hopes are entertained that their efforts will be crowned with success. Should the coffers of the Italian exchequer derive advantage from the opening up of this new, and hitherto neglected, branch of industry in Italy, the Italian Government will not repent of having bestowed honours on Mr. Fairman, who will leave behind him telling proof of having worked in Italy, and contributed at an opportune moment to point out a means by which the Italian finances may be fairly augmented. It appears that at the present moment the oil dealers of Sassuolo and Modena are in the habit of sending daily to the surface wells of Monte Gibro and Monte Baranzone for petroleum, to meet the wants of those and the neighbouring cities, where it is burnt in its crude state, under the name of "Lucilma." It is also consumed and known by the same name in Bologna, Reggio, Parma, Genoa, &c. Labour in those parts is plentiful, good, and cheap. The roads are excellent, and access to the vicinity of the wells is easy. The main trunk of railway passes within a short distance of the spots of production, and the ports of Ancona (on the Adriatic) and Leghorn and Genoa (on the Mediterranean) are very accessible by railroad for the transport to and from the oil regions. Mr. Fairman further states that the exports of petroleum from the United States to Naples, Palermo, Genoa, Leghorn, Marseilles, and Trieste increased from 1662 gallons in 1861, to 2,906,683 in 1864, and further to 3,301,749 gallons in 1867; and he observes that the Italian petroleum would naturally be consumed in the country, and would also go to provide the markets of Trieste, Marseilles, Malta, Turkey, and the Mediterranean ports.

PATENT LAW AMENDMENT.—A petition is in course of signature in various parts of the kingdom by the members of the Inventors, Institute, Working Men's Clubs, Foremen Engineers' Association, and several other societies whose members are "engaged in devising and practically applying new inventions, or otherwise interested in the commercial and industrial prosperity of the United Kingdom," praying the enactment of such laws as will remedy exisiting evils. The petitioners urge that the chief evils of the present laws are the exorbitant cost of a patent; the imperfect security which it affords to the inventor; the litigation which its maintenance entails; and the expensive, vexatious, and cumbersome character of the litigation attending disputed questions of patent right. And it is submitted that these evils may be remedied by reducing the cost of securing invention-right to a moderate sum not exceeding what is necessary to defray office expenses, and distributing the payment thereof over a certain period, as has been done with such decided advantage in other countries; by subjecting applications for invention-right to a preliminary investigation as to novelty, and after suitable delay and public notice, securing to proprietors of invention-right an indefeasible title; and by instituting a special tribunal for dealing with disputed questions of invention-right.

MCGAULEY, AND INDUCTION APPARATUS.—It appears to be now conclusively shown that Ruhmkorff was a mere copyist in connection with the induction coil, and that his only merit consisted in making the instrument according to the designs of others. In connection with the early history of induction apparatus, Prof. C. G. Page, the chief examiner in the United States Patent Office, states, in a letter to the late Sir David Brewster, that noticing the death of Prof. McGauley mentioned in the *Scientific Review*, he sends his (Prof. Page's) book on induction, in which he makes honourable mention of his name; he had traced the invention of the hammer circuit breaker, so extensively used in connection with induction coils all the world over (attributed in Europe and America respectively to Dr. Neef and himself), to Professor McGauley. Prof. Page expresses the hope that the publication of this fact may be of benefit in relation to the efforts making to raise means for the maintenance of his widow and family.

PRIMING OF STEAM-BOILERS.—At the recent meeting of the Liverpool Polytechnic Society Mr. R. D. NAPIER read a paper on this subject. He proposes to prevent priming by the use of a steam dome, the bottom of which is below the water level. The steam is admitted to the dome near the top by a separate pipe, which curves slightly downward upon entering, and the outlet to the engine is at the top of the dome. Mr. Napier considers that by closing the bottom of the dome at the level of the shell of the boiler, the quantity of water condensed in the dome, which is of course converted into a surface-condenser, will be equal to the quantity of water which would otherwise be carried with the steam to the engine. He refers to experiments in which by closing the bottom of the dome the water accumulated, with his arrangement, at the rate of from 56 to 140 gallons per minute.

FERRYHILL COLLIERY.—The Rosedale and Ferryhill Iron Company have struck the Harvey seam, upwards of 4 ft. thick, at their Jane pit winning at Ferryhill. This undertaking has been one of great expense, and required no little faith in its ultimate success on the part of Mr. Morrison and his partners, Messrs. Leeman and Sherriff. Many who knew the district predicted the company would never recover the capital they were sinking in this enterprise, but with his characteristic energy and determination Mr. Morrison prosecuted the work of sinking to its present successful termination. As the sinking is close to the blast furnaces this fine bed of coal will be an immense gain to the company, who contemplate raising upwards of 2000 tons of coal per day, and erecting several hundred coke ovens, to convert the small coal into coke, which can be delivered to the furnaces without the usual heavy railway carriage that swells so enormously the working expenses of the manufacturer, and not unfrequently operates as a barrier to the development of large and costly undertaking.—*Durham Advertiser.*

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BLAKE'S PATENT STONE BREAKER,

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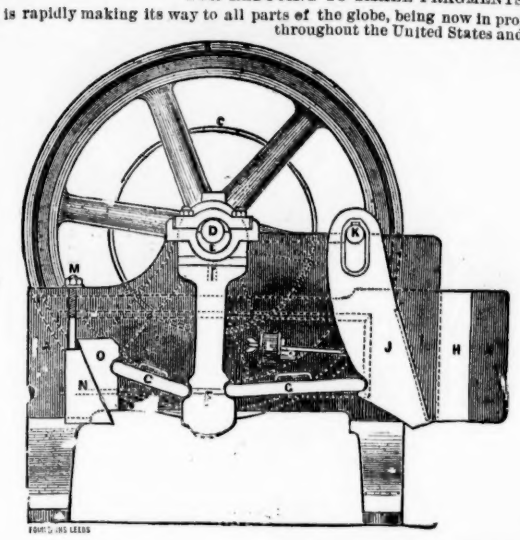
It is rapidly making its way to all parts of the globe, being now in profitable use in California, Washoe, Lake Superior, Australia, Cuba, Chili, Brazil, and throughout the United States and England. Read extracts of testimonials:—



The Parys Mines Company, Parys Mines, near Bangor, June 6.—We have had one of your stone breakers in use during the last twelve months, and Captain Morcom reports most favourably as to its capabilities of crushing the materials to the required size, and its great economy in doing away with manual labour.
For the Parys Mining Company, JAMES WILLIAMS.
H. R. Marsden, Esq.

Ecton Emery Works, Manchester.—We have used Blake's patent stone breaker made by you, for the last 12 months, crushing emery, &c., and it has given every satisfaction. Some time after starting the machine a piece of the moveable jaw s about 20 lbs. weight, chilled cast-iron, broke off, and was crushed in the jaws of the machine to the size fixed for crushing the emery.
H. R. Marsden, Esq. —— THOS. GOLDSWORTHY & SONS.

Alkali Works, near Wednesbury.—I at first thought the outlay too much for so simple an article, but now think it money well spent. WILLIAM HUNT.

Welsh Gold Mining Company, Dolgelly,—The stone breaker does its work admirably, crushing the hardest stones and quartz. WM. DANIEL.

Our 15 by 7 in. machine has broken 4 tons of hard whinstone in 20 minutes, for fine road metal, free from dust. Messrs. ORD and MADDISON,
Stone and Lime Merchants, Darlington.

Kirkless Hall, near Wigan.—Each of my machines breaks from 100 to 120 tons of limestone or ore per day (10 hours), at a saving of 4d. per ton.
JOHN LANCASTER.

Ovoca, Ireland.—My crusher does its work most satisfactorily. It will break 10 tons of the hardest copper ore stone per hour. WM. G. ROBERTS.

General Frémont's Mines, California.—The 15 by 7 in. machine effects a saving of the labour of about 30 men, or $75 per day. The high estimation in which we hold your invention is shown by the fact that Mr. Park has just ordered third machine for this estate. SILAS WILLIAMS.

For circulars and testimonials, apply to—

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ONLY MAKER IN THE UNITED KINGDOM. 119

CAUTION!

BLAKE'S PATENT STONE BREAKER,

In Chancery.

BLAKE v. ARCHER, NOVEMBER 12, 1867.

His Honour the Vice-Chancellor WOOD having found a VERDICT in FAVOUR of the PLAINTIFFS in the above Cause, establishing the VALIDITY of BLAKE'S PATENT, and made a DECREE for an INJUNCTION to RESTRAIN the DEFENDANTS, Messrs. THOMAS ARCHER and SON, of Dunston Engine-Works, near Gateshead-on-Tyne, from INFRINGING such PATENT, and ordering them to pay to the Plaintiffs the costs of the Suit.

ALL PERSONS are hereby CAUTIONED against MANUFACTURING, SELLING, or USING any STONE BREAKERS similar to BLAKE'S, which have not been manufactured by the Plaintiffs. Application will forthwith be made to the Court of Chancery for INJUNCTIONS AGAINST ALL PERSONS who may be found INFRINGING BLAKE'S PATENT after this notice. 120

SOLE MAKER IN ENGLAND,

H. R. MARSDEN, SOHO FOUNDRY, MEADOW LANE, LEEDS.

PARIS EXHIBITION, 1867. SILVER MEDALS, CLASSES 40—51.

AWARDED THE ONLY FIRST-CLASS MEDAL FOR CRUCIBLES.

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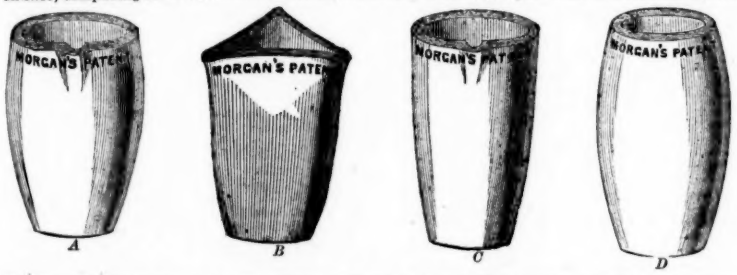
These Crucibles (MORGAN'S PATENT) *were the only ones to which Prize Medals were awarded in London*, 1862; *Dublin* 1865; *New Zealand*, 1865; *and Oporto*, 1865.

They have been in use for many years in the English, Colonial, French, and other Foreign Mints; the English, French, and other Arsenals; and have been adopted by most of the large Engineers, Founders, and Refiners at Home and Abroad.

The capabilities which have now for more than twelve years distinguished these Crucibles are:—

Their quality is uniform. They withstand the greatest heat without danger. Their average durability for Gold, Silver, Copper, and other ordinary metals is forty to fifty pourings, in some cases reaching one hundred. They never crack, and heat more rapidly than any other kind. One annealing only is required. Change of temperature has no effect. They can when hot from the furnace be dipped in cold water with safety. The saving of labour and metal is very great. (Messrs. BREEDEN and BOOTH, Birmingham, testify to the saving of 1 ton 2 qrs. 21 lbs. 4 ozs. of metal in melting 73 tons 6 cwts. of brass.) In *Steel Melting* the saving of fuel has been denomstrated to amount to a ton and a half to every ton of steel fused. For *Zinc* they last longer than iron pots, and save the great loss which arises from mixture with iron. Those for *Malleable Cast-iron* show an average working of seven days, doing each day nearly double the work of any other crucible.

As these crucibles last much longer than any others, it follows that the saving of metal must be great, because to each worn crucible a quantity of metal adheres. In fact, comparing these with other crucibles, the saving of *metal* and *fuel* alone is more than equivalent to *their cost.*



A are made in sizes varying from 2 ozs. to any required capacity, and are marked by the quantity of kilogrammes they will contain; thus No. 100 will contain 100 kilogrammes.
B differ in shape, but correspond in all other respects with *A*, and are similarly marked.
C are marked in English pounds—thus, a crucible marked 60 will contain 60 lbs.
D are made expressly for steel in various sizes.

MORGAN'S PATENT CRUCIBLES

Can be made any shape or size required, and are stamped as below:—

Having secured new Patents for our Manufacture, and to prevent fraudulent Imitations,

we call particular attention to our Trade Mark, as here shown.

"It follows, with the persistence of a law, that originators should be beset by imitators, just as in the natural world the finest organic forms are most liable to parasitical growth."—Miss METEYARD'S *Life of Josiah Wedgewood, the Potter.*

In all instances please specify "MORGAN'S PATENT," and address to—

BATTERSEA WORKS, LONDON, S.W.

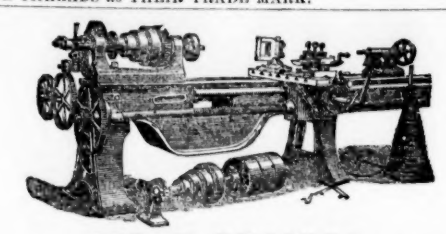
Complete Illustrated List forwarded on application. 121

BICKFORD'S PATENT SAFETY FUSE

Obtained the PRIZE MEDALS at the "ROYAL EXHIBITION" of 1851; at the "INTERNATIONAL EXHIBITION" of 1862, in London; at the "IMPERIAL EXPOSITION" held in Paris, in 1855; at the "INTERNATIONAL EXHIBITION," in Dublin, 1865; and at the "UNIVERSAL EXPOSITION," in Paris, 1867.

BICKFORD, SMITH, AND CO. of TUCKINGMILL, CORNWALL, MANUFACTURERS of PATENT SAFETY-FUSE, having been informed that the name of their firm has been attached to fuse not of their manufacture, beg to call the attention of the trade and public to the following announcement:—

EVERY COIL of FUSE MANUFACTURED by them has TWO SEPARATE THREADS PASSING THROUGH the COLUMN of GUNPOWDER, and BICKFORD, SMITH, AND CO. CLAIM SUCH TWO SEPARATE THREADS as THEIR TRADE MARK. 142



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ENGINEERS' TOOLS, BUILDERS' CONTRACTORS' COLLIERY PLANT, AND MACHINERY,

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FOR SALE OR HIRE,
At greatly reduced prices. Best materials, workmanship, and finish, warranted 173

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ENGINEERING, MILL VALUER, AUCTIONEER, &c.,
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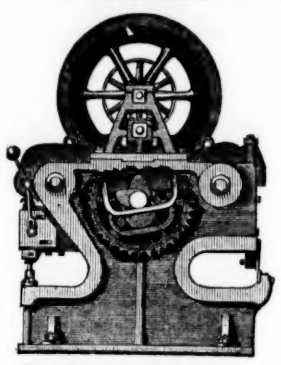

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1¼ × 1¼ in. × 24 in.=8 tons, £185.
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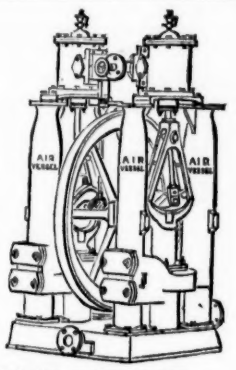

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STEAM PUMPS,
From 2 to 12 in. diameter,
SINGLE AND DOUBLE-ACTING.
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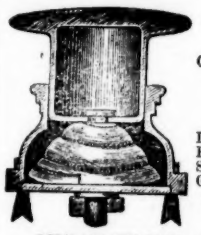

MANUFACTURERS OF
CAST STEEL for PUNCHES, TAPS, and DIES, TURNING TOOLS, CHISELS, &c.
CAST STEEL PISTON RODS, CRANK PINS, CONNECTING RODS, STRAIGHT and CRANK AXLES, SHAFTS and FORGINGS of EVERY DESCRIPTION.
DOUBLE SHEAR STEEL,
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Where the largest stock of steel, files, tools, &c., may be selected from. 125

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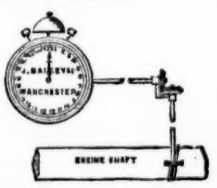
WINDING INDICATORS AND SIGNAL BELLS.
Illustrated catalogue of useful inventions, 6 stamps.



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JOHN AND EDWIN WRIGHT,

PATENTEES.
(ESTABLISHED 1770.)
MANUFACTURERS OF EVERY DESCRIPTION OF IMPROVED
PATENT FLAT AND ROUND WIRE ROPES,
From the very best quality of charcoal iron and steel wire.
PATENT FLAT AND ROUND HEMP ROPES.
SHIPS' RIGGING, SIGNAL AND FENCING STRAND, LIGHTNING CONDUCTORS, STEAM PLOUGH ROPES (made from Webster and Horsfall's patent steel wire), HEMP, FLAX, ENGINE YARN, COTTON WASTE, TARPAULING, OIL SHEETS, BRATTICE CLOTHS, &c.
UNIVERSE WORKS, MILLWALL, POPLAR, LONDON.
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CITY OFFICE No. 5, LEADENHALL STREET, LONDON, E.C. 127

Swan Rope Works.

GARNOCK BIBBY, AND CO.,
CHAPEL STREET, LIVERPOOL,
MANUFACTURERS of FLAT and ROUND HEMP and IRON and STEEL WIRE ROPES for MINING, RAILWAY, and SHIPPING PURPOSES.
MANILLA ROPE of SUPERIOR QUALITY, FIFTY PER CENT. STRONGER and THIRTY PER CENT. CHEAPER than Russian hemp rope.
WIRE ROPE of FIRST QUALITY WIRE, and the HIGHEST STANDARD of STRENGTH. 128

THE NEWCASTLE CHRONICLE AND NORTHERN COUNTIES ADVERTISER. (ESTABLISHED 1764.)
Published every Saturday, price 2d., or quarterly 2s. 2d.
THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER.
Published every morning. Price 1d.
Offices, 42, Grey-street, Newcastle-upon-Tyne; 50, Howard-street, North Shields; 195, High-street, Sunderland. 127

CONSULT DR. HAMMOND (of the LOCK HOSPITAL, &c.), No. 11, Charlotte-street, Bedford-square, London, W.C., in all those ailments which tend to embitter and shorten life, and especially those termed PECULIAR and CONFIDENTIAL. At home, Nine to Two, and Three to Eight; Sundays, Ten to Twelve. The "Self-Curative Guide" post free, two stamps.
N.B.—Cases of recent infection cured in two days. 130

ELECTRICITY IS LIFE.
CURE YOURSELF BY THE PATENT SELF-ADJUSTING CURATIVE AND ELECTRIC BELT.—Sufferers from spermatorrhœa nervous debility, painful dreams, &c., can now cure themselves by the only guaranteed remedy in Europe, protected by Her Majesty's great seal. Free for one stamp by H. JAMES, Esq., Percy House, Bedford-square, London.
N.B.—Medicine and fees superseded.
Reference to the leading Physicians of the day 131

Contract for Coals for Jellah Coffee, Bight of Benin.

CONTRACT DEPARTMENT, ADMIRALTY, SOMERSET HOUSE.

THE COMMISSIONERS for Executing the Office of Lord High Admiral of the United Kingdom of Great Britain and Ireland, do hereby give notice that, on TUESDAY, the 5th of May next, at Two o'clock, they will be READY to TREAT with such persons as may be WILLING to CONTRACT for SUPPLYING and DELIVERING on board Her Majesty's ship Vindictive coal depôt, at Jellah Coffee, Bight of Benin,

ONE THOUSAND TONS OF SMOKELESS SOUTH WALES COALS,

Fit for the service of Her Majesty's steam-ships and vessels.

One-half of the coals to be shipped in the month of May, and the remainder in the month of July next.

A form of the tender and conditions of contract may be seen in the lobby of the Storekeeper-General's Department, Admiralty, Somerset House. No tender will be received after Two o'clock on the day of treaty, nor will any be noticed unless the party attends, or an agent for him duly authorised in writing.

Every tender must be addressed to the Secretary of the Admiralty, and bear in the left-hand corner the words "Tender for Coals for Jellah Coffee," and must also be delivered at the Department of the Storekeeper-General, Admiralty, Somerset House, accompanied by a letter signed by two responsible persons, engaging to become bound with the person tendering in the sum of £25 per cent. on the value for the due performance of the contract.

By order, ANTONIO BRADY,
Registrar of Contracts and Public Securities.

Contract Department, Admiralty, Somerset House, April 15, 1868.

Army Contracts—Bread and Meat.

WAR OFFICE, PALL MALL, LONDON, S.W.

NOTICE IS HEREBY GIVEN, that the Secretary of State for War will be prepared to RECEIVE TENDERS for the SUPPLY of BREAD and MEAT for the use of Her Majesty's Land Forces stationed in the following districts during a period of six months, commencing 1st June, 1868—viz.:

NORTH BRITAIN DISTRICT	....	Commissariat Office,	3, Hill-st., Edinburgh
NORTHERN ,,	....	ditto	Barrack-st., Hulme, Manchester.
EASTERN ,,	....	ditto	The Camp, Colchester
SOUTH-EASTERN ,,	....	ditto	4, Castle-st., Dover.
WESTERN ,,	....	ditto	20, East Emma-place, Plymouth.
SOUTH-WESTERN ,,	....	ditto	St. Thomas-street, Portsmouth.
LONDON ,,	....	ditto	109, Victoria-st., S.W.
CHATHAM ,,	....	ditto	The Barracks, Chatham.
WOOLWICH ,,	....	ditto	Royal Artillery, Barracks, Woolwich
CHANNEL ISLANDS ,,	....	ditto	Grosvenor-st., Jersey

Printed forms of tender, initialed and numbered, and conditions of contract may be obtained on application to the senior commissariat officer of the district and no tender will be entertained unless made upon the printed form so obtained.

The tenders must be sent to this office, addressed to the director of contracts marked on the outside "Tender for Commissariat Supplies," before 12 o'clock on Tuesday the 21st instant, after which day no tender will be received.

The Secretary of State for War reserves the right of rejecting any or all of the tenders. THOMAS HOWELL, Director of Contracts.

War Office, Pall Mall, London, S.W., April 6, 1868.

Contract for Sheet Copper.

BY ORDER OF THE SECRETARY OF STATE FOR INDIA IN COUNCIL.

NOTICE IS HEREBY GIVEN that the DIRECTOR-GENERAL OF STORES FOR INDIA will be READY, on or before Monday, the 20th of April, to RECEIVE PROPOSALS in writing, sealed up, from such persons as may be willing to SUPPLY—

SHEET COPPER.

And that the conditions of the said contract may be had on application, addressed to the Director-General of Stores, India Office, Westminster, S.W., where the proposals are to be left any time before Two o'clock P.M. of the said 20th of April, after which hour no tender will be received.

India Office, April 13, 1868. GERALD C. TALBOT, Director-General.

Contract for Best British Iron.

BY ORDER OF THE SECRETARY OF STATE FOR INDIA IN COUNCIL.

NOTICE IS HEREBY GIVEN that the DIRECTOR-GENERAL OF STORES FOR INDIA will be READY on or before Monday, the 20th instant, to RECEIVE PROPOSALS, in writing, sealed up, from such persons as may be willing to SUPPLY—

BEST BRITISH IRON.

And that the conditions of the said contract may be had on application addressed to the Director-General of Stores, India Office, Westminster, S.W., where the proposals are to be left any time before Two o'clock P.M. of the said 20th day of April, 1868, after which hour no tender will be received.

India Office, April 13, 1868. GERALD C. TALBOT, Director-General.

Contract for Iron Kentledge.

BY ORDER OF THE SECRETARY OF STATE FOR INDIA IN COUNCIL.

NOTICE IS HEREBY GIVEN, that the DIRECTOR-GENERAL OF STORES FOR INDIA will be READY, on or before MONDAY, the 20th April, to RECEIVE PROPOSALS, in writing, sealed up, from such persons as may be willing to SUPPLY—

IRON KENTLEDGE.

And that the conditions of the said contract may be had on application, addressed to the Director-General of Stores, India Office, Westminster, S.W., where the proposals are to be left any time before Two o'clock P.M. of the said 20th day of April, after which hour no tender will be received.

India Office, April 13, 1868. GERALD C. TALBOT, Director-General.

Contract for Best Swedish Iron.

BY ORDER OF THE SECRETARY OF STATE FOR INDIA IN COUNCIL.

NOTICE IS HEREBY GIVEN that the DIRECTOR-GENERAL OF STORES FOR INDIA, will be READY, on or before Monday, the 27th April, to RECEIVE PROPOSALS in writing, sealed up, from such persons as may be willing to SUPPLY—

BEST SWEDISH IRON.

And that the conditions of the said contract may be had on application, addressed to the Director-General of Stores, India Office, Westminster, S.W., where the proposals are to be left any time before Two o'clock P.M. of the said 27th April, 1868, after which hour no tender will be received.

India Office, April 18, 1868. GERALD C. TALBOT, Director-General.

The Miners' Association of Cornwall and Devonshire.

THE MINERS' ASSOCIATION OF CORNWALL AND DEVONSHIRE.—The GENERAL MEETING, to receive the report of the Council, to examine the financial position of the society, and for other important business, will be HELD at the Public Rooms, Redruth, on MONDAY, the 20th instant.

The chair will be taken by JOHN ST. AUBYN, Esq., M.P., at Two P.M.
The Council will meet at half-past One P.M.

ROBERT HUNT, Honorary General Secretary.

Practical Geology, King's College, London.

PROF. TENNANT, F.G.S., will give a COURSE of LECTURES on GEOLOGY, having especial reference to the application of the science to ENGINEERING, MINING, ARCHITECTURE, and AGRICULTURE. The LECTURES will COMMENCE on WEDNESDAY, April 22, at Nine A.M. They will be continued on each succeeding Friday and Wednesday at the same hour. Fee, £1 11s. 6d. R. W. JELF, D.D., Principal.

Royal School of Mines, Jermyn-street.

DR. TYNDALL, F.R.S., will COMMENCE a COURSE of THIRTY-TWO LECTURES on MAGNETISM, ELECTRICITY, SOUND, LIGHT, and HEAT, at Three o'clock, on Monday, the 27th April, to be continued on every weekday but Saturday at the same hour. Fee for the course, £3.

TRENHAM REEKS, Registrar.

AMERICAN MINES.

MR. R. P. ROTHWELL, Mining Engineer and Metallurgist, OFFICE,—WILKES-BARRE, PENNSYLVANIA, U.S., Having a LARGE EXPERIENCE in EUROPEAN and AMERICAN MINES, can FURNISH RELIABLE INFORMATION on the VALUE of MINERAL PROPERTY in any part of the UNITED STATES or the dominion of CANADA.

MINERAL LANDS OF NOVA SCOTIA.

INTERNATIONAL MINING AGENCY,
OFFICE, SOMERSET HOUSE, PRINCE STREET,
MAIL ADDRESS, BOX 266, G.P.O., HALIFAX, NOVA SCOTIA.
A. HEATHERINGTON, PROPRIETOR.

A Register kept of every description of Mineral Lands and Mining Shares for Sale.—Properties Viewed and Reported on, and their Purchase or Sale, when required, negotiated for a moderate commission.—The services of Explorers, Overseers, &c., engaged for Mine Owners.—Maps, Diagrams, Statistics, and useful information regarding each district supplied.—Returns made for absent proprietors.

THE MINING SHARE LIST.

BRITISH DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Business.	Total divs.	Per share.	Last paid.
1500	Alderley Edge, c, Cheshire*	10 0 0	—		9 7 8	0 5 0	Jan. 1868
200	Botallack, t, c, St. Just	91 5 0	—		488 15 0	5 0 0	May 1866
4000	Brookwood, c, Buckfastleigh	1 11 0	—		0 10 0	0 2 6	April 1868
:000	Bronfloyd, l, Cardigan*	12 0 0	—		9 3 0	0 6 0	Jan. 1868
6400	Cashwell, l, Cumberland*	2 10 0	—		0 1 6	0 1 6	Aug. 1866
916	Cargoll, s-l, Newlyn	15 5 7	—	22½ 23½	14 5 0	0 10 0	Jan. 1868
509	Creegbrawse and Penkevil, t	—	—		2 0 0	1 0 0	April 1868
867	Cwm Erfin, l, Cardiganshire*	7 10 0	—		26 13 0	0 15 0	April 1868
128	Cwmystwith, l, Cardiganshire	60 0 0	—		381 10 0	2 0 0	Dec. 1867
280	Derwent Mines, s-l, Durham	300 0 0	—		174 10 0	5 0 0	June 1867
1024	Devon Gt. Consols, c, Tavistock†	1 0 0	455		1095 0 0	7 0 0	Mar. 1868
656	Ding Dong, t, Gulval‡	49 14 6	—		0 10 0	0 10 0	Sept. 1867
358	Dolcoath, c, t, Camborne	128 17 6	—		844 10 0	4 0 0	April 1868
6144	East Caradon, c, St. Cleer†	2 14 6	3¾	3½ 3¾	14 11 6	0 2 0	July 1867
300	East Darren, l, Cardiganshire	32 0 0	—		150 10 0	2 0 0	Dec. 1867
128	East Pool, t, c, Pool, Illogan	24 5 0	—		427 10 0	5 0 0	Mar. 1868
1906	East Wheal Lovell, t, Wendron	3 9 0	8¾	8½ 8¾	3 11 6	0 10 0	Dec. 1867
2800	Foxdale, l, Isle of Man*	25 0 0	—		71 0 0	0 10 0	Sept. 1867
5000	Frank Mills, l, Christow	3 18 6	—		3 5 6	0 5 0	Feb. 1866
3950	Gawton, c, Tavistock	3 10 6	2⅞		0 3 0	0 3 0	Jan. 1868
15000	Great Laxey, l, Isle of Man*	4 0 0	17½	16½ 17½	8 5 0	0 10 0	Mar. 1868
5908	Great Wheal Vor, t, c, Helston†	40 0 0	19	18 19	12 15 6	0 7 6	Mar. 1868
1024	Herodsfoot, l, near Liskeard†	8 10 0	39	38 40	45 0 0	1 10 0	Feb. 1868
6000	Hingston Down, c, Calstock†	5 10 6	—		0 10 0	0 5 0	April 1866
400	Lisburne, l, Cardiganshire	18 15 0	—		498 10 0	3 0 0	Dec. 1867
3000	Maes-y-Safn, l, Flint*	20 0 0	28	25 28	3 15 0	0 15 0	April 1868
9000	Marke Valley, c, Caradon	4 10 6	6⅜	6½ 6¾	4 8 6	0 4 0	April 1868
3000	Minera Boundary, l, Wrexham*	1 0 0	—		0 13 0	0 3 0	Mar. 1866
1800	Minera Mining Co. l, Wrexham*	25 0 0	175	165 175	228 13 0	5 0 0	Feb. 1868
20000	Mining Co. of Ireland, c, l, cl.	7 0 0	—		—	0 5 7	Jan. 1867
40000	Mwyndy Iron Ore*†	3 5 0	—		0 8 6	0 2 0	Mar. 1868
200	Parys Mines, c, Anglesey*	50 0 0	—		157 10 0	5 0 0	Jan. 1866
12800	Prince of Wales, t, Calstock	0 12 6	53s.	2⅜ 2½	0 4 6	0 1 0	Feb. 1868
6000	Prosper United, t, c, St. Hilary	8 14 0	—		0 5 0	0 5 0	Feb. 1867
1120	Providence, t, Uny Lelant†	10 6 7	30	28 29	84 12 6	0 10 0	Feb. 1868
512	South Caradon, c, St. Cleer†	1 5 0	410		580 10 0	6 0 0	Mar. 1868
6000	South Darren, l, Cardigan*	3 6 6	—		0 10 0	0 1 6	April 1868
496	So. Wh. Frances, c, Illog.†‡	18 18 9	21	19 21	374 13 6	1 0 0	Mar. 1868
508	Summer Hill, l, Mold	3 13 6	—		2 5 6	0 5 0	Feb. 1868
6000	Tincroft, c, t, Pool, Illogan†	9 0 0	15½	14½ 15½	19 6 0	0 5 0	Mar. 1868
2000	Trumpet Cons., t, Helston	11 10 0	—		12 10 0	0 10 0	Mar. 1868
3000	W. Chiverton, l, Perranzabuloe†	10 0 0	65½	64½ 66½	25 7 6	2 0 0	Feb. 1868
5000	West Godolphin, t, c, Breage	0 1 0	—		0 2 0	0 2 0	Dec. 1867
400	W. Wheal Seton, c, Camborne†	47 10 0	210	205 210	494 0 0	5 0 0	April 1868
512	Wheal Basset, c, Illogan†	5 2 6	67	65 67½	631 10 0	1 0 0	April 1868
1024	Wheal Friendship, c, Tavistock	20 0 0	—		300 10 0	0 10 0	Nov. 1866
512	Wheal Jane, s-l, Kea	10 10 0	—		—	2 0 0	Jan. 1868
4295	Wheal Kitty, t, St. Agnes	5 4 6	2½		3 5 0	0 2 0	Feb. 1868
1024	Wheal Mary Ann, l, Menheniot†	8 0 0	22	21 22	64 5 0	0 17 6	Mar. 1868
80	Wheal Owles, t, St. Just‡	70 0 0	—		350 13 0	7 10 0	Feb. 1868
2000	Wheal Rose, c, Scorrier	—	—		1 0 0	0 10 0	Feb. 1866
396	Wheal Seton, t, c, Camborne	58 10 0	80	75 80	254 15 0	2 0 0	Feb. 1868
3000	Whitewell Lead, Clitheroe*	0 5 0	—		1 0 0	0 10 0	Dec. 1867
17000	Wicklow, c, i, Wicklow	2 10 0	—		48 16 0	0 16 0	April 1868

FOREIGN DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Business.	Total divs.	Per share.	Last paid.
25000	Alamillos, l, Spain*†	2 0 0	2¼	1¾ 2	0 2 6	0 1 6	Mar. 1868
20000	Australian, c, South Australia†‡	7 7 6	—		0 1 0	0 1 0	Aug. 1867
15000	Cape Copper Mining*†	7 0 0	11	11⅜	3 2 6	0 10 0	Feb. 1868
76162	Don Pedro North del Rey*†‡	0 14 0	3	2¾ 3	0 15 9	0 5 0	Mar. 1868
70000	English and Australian, c‡	2 10 0	¾	⅝ ⅞	—	0 1 0	Feb. 1868
25000	Fortuna, l, Spain*†	2 0 0	2	1¾ 2	1 9 4	0 2 0	Mar. 1868
20000	Gen. Mining Assoc., Nova Scotia†	20 0 0	—		23 10 0	0 15 0	June 1867
10000	Gonnesa, l,* [5000 £5 pd., 5000 £4 pd.]		—		10 per cent.		July 1867
68000	Kapunda Mining Co., Austra†‡	1 0 0	⅜	⅛ ⅜	0 0 10	0 0 10	Nov. 1867
15000	Linares, t, Spain*†	3 0 0	2¼	2 2¼	11 11 8	0 3 4	Mar. 1868
50000	Panulcillo, c, Chili*†	3 0 0	2¼		10 per cent.		Yearly.
6000	Peel River Land and Mineral*†	100 0 0	—		—	—	
100000	Pontgibaud, s-l, France†	20 0 0	11		4 14 3	0 11 0	June 1867
10000	Port Phillip, g, Clunes†	1 0 0	1⅜	1⅜ 1½	1 0 0	0 1 6	Jan. 1868
20000	Scottish Australian Min. Co.†	1 0 0	1¼		7½ per cent.		Nov. 1867
11000	St. John del Rey, Brazil*†	15 0 0	22½	20½ 21½	81 10 0	4 5 0	Dec. 1867
13500	Vancouver, cl*†‡	6 0 0	—		1 4 6	0 3 6	Feb. 1868
50000	Victoria (London) [25000 £1 pd., 25000 12s. 6d. pd.]				0 9 0	0 1 0	Jan. 1866
40000	West Canada Mining Co.*	1 0 0	—		0 19 6	0 2 6	May 1866

NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Paid.	Last Pr.	Bus. done.	Last Call.
50000	Anglo-Argentine, s, Argentine Republic*	1 0 0	1⅛		
100000	Anglo-Brazilian, g*†	0 10 0	⅜	⅜	Nov. 1866
12500	Anglo-Italian, g*†	0 10 0	¾		Jan. 1868
20000	Australian United, g	1 0 0	—		Mar. 1868
2464	Burra Burra, c, South Australia‡	5 0 0	—		
25000	Capula, s, Mexico*†	1 12 0	⅝		Aug. 1866
30000	Chontales, g, s, Nicaragua*†	5 0 0	4⅛	3⅜ 3⅞	Mar. 1868
12000	Cobre Copper Company, c, Cuba†‡*	45 10 0	—		Jan. 1868
10000	Copiapo Mining Company, Chili†‡	16 10 0	—		
10000	Copiapo Smelting, Chili*	10 0 0	—		April 1866
300	Copper Miners' Co. of South Australia* [150 £100 pd., 150 £70 pd.]				Nov. 1866
15000	El Chico Silver Mining and Reduction Company*	5 0 0	—		Nov. 1866
40000	Fortune Copper Mining Co. of Western Australia	2 0 0	—		Fully pd.
50000	Frontino and Bolivia, g, New Granada*†	1 15 0	⅝	13s. 15s.	June 1867
10000	Great Barrier Land, Mining, &c., New Zealand	5 0 0	—		Fully pd.
80000	Great Northern, c, South Australia†	1 11 6	—		Sept. 1862
7927	Lusitanian (Portugal)†‡	3 0 0	—		
83640	Mariquita, g, s, New Granada	1 0 0	—		Feb. 1868
12500	Nerbudda Coal and Iron, India*†	6 0 0	5	4¼ 4¾	Dec. 1867
51000	New Quebrada, c, Venezuela*†	3 10 0	—	¼ ½	
15000	Otea, c, New Zealand*	2 0 0	—		Fully pd.
80000	Pestarena United, g, Italy*†	2 15 0	2½	2⅜ 2⅝	
10178	Rhenish Consolidated, l [6000 £5 pd., 4178 £2 10s. pd.]	—	—		May 1866
100000	Rossa Grande, g, Brazil*†	0 14 0	¾	13s. 15s.	June 1867
15000	San Pedro del Monte, s, Mexico*	4 0 0	—		Sept. 1866
10000	San Roque, l, Spain	5 0 0	—		Fully pd.
100000	Taquaril, g, Brazil*	0 5 0	—		Oct. 1867
6000	Terreseu, s-l, Isle of Sardinia	2 0 0	—		
43174	United Mexican, s, Mexico†‡	28 5 0	1⅞	1½ 2	
30000	Val Antigoria, g, Italy*	1 2 6	—		
6000	Val Sassam, s, c, l, Italy*†	7 0 0	—		Aug. 1867
45000	Victor Emanuel, c, Italy*	1 0 0	—		Fully pd.
20000	Washoe, g, Nevada†	5 0 0	—		Fully pd.
80000	Worthing, c, South Australia*†	1 0 0	—		Fully pd.
75000	Yorke Peninsula, South Australia	1 0 0	—		Fully pd.
45000	Yudanamutana, c, South Australia*†‡	3 0 0	2⅜	2¼ 2½	Fully pd.

NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Bus. done.	Last Call.
914	Caradon Consols c, St. Cleer	32 13 6	—		Aug. 1867
1000	Carn Brea, c, t, Illogan‡	28 0 0	22½	19 21	May 1867
5000	Carnarvonshire, l, Carnarvon*	4 0 0	—		Fully pd.
3000	Chiverton, l, Perranzabuloe	10 0 0	3	2⅜ 2⅞	Feb. 1868
3000	Chiverton Moor, l, Perranzabuloe	6 8 6	6	5¾ 6	Aug. 1867
2880	Clifford Amalgamated, c, Gwennap‡	33 17 6	6⅛	5¾ 6	June 1867
2450	Cook's Kitchen, c, Illogan‡	19 14 9	12	11 12	July 1866
1055	Craddock Moor, c, St. Cleer‡	13 4 0	—		Mar. 1868
12800	Drake Walls, t, Calstock‡	2 5 0	¾	⅝ ¾	Dec. 1866
512	East Basset, c, Redruth†‡	34 10 0	11		Mar. 1868
6000	East Carn Brea, c, Redruth‡	3 15 0	1½	1⅛ 1⅜	
6000	East Grenville, c, Camborne	3 15 6	2⅛	1¾ 2	Feb. 1868
4000	East Wheal Russell, c, Tavistock†	12 15 6	¾	⅜ ⅝	Jan. 1868
6144	Gonamena, c, St. Cleer	7 6 9	—		April 1868
5000	Great North Downs, c, Redruth	6 13 0	4		Feb. 1867
4800	Great Retallack, s-l, b, Perranzabuloe	2 6 0	—	2¼ 2½	Jan. 1868
5143	Great South Tolgus, c, Redruth	1 6 0	¾	½ ⅝	Feb. 1868
1798	Great Wheal Fortune, t, Breage	31 7 4	—		Mar. 1868
1024	Nangiles, t, c, Kea	29 17 0	—		Feb. 1868
400	New Wheal Seton, c, Camborne	58 10 0	—		Aug. 1867
3457	North Downs, c, Redruth	5 8 10	1⅜	1⅛ 1¼	Jan. 1868
695	North Roskear, c, Camborne	57 19 0	12	10 12	Mar. 1868
5936	North Treskerby, c, St. Agnes	1 9 0	24s.	1¼ 1⅜	Dec. 1860
5610	North Wheal Crofty, c, Illogan†	3 11 3	3	2⅞ 3⅛	July 1866
3000	North Wheal Chiverton, l, Perranzabuloe	4 0 0	4½	4 4½	Mar. 1867
5000	Old Westminster, l, Denbigh	2 0 0	6		June 1867
8465	Pedn-an-drea, t, Redruth	6 8 6	—		Nov. 1867
1024	Rose and Chiverton United, l, Newlyn	5 10 0	—		Feb. 1868
6138	South Condurrow, t, c, Camborne	4 0 6	⅝		Feb. 1868
940	St. Ives Consols, t, St. Ives‡	10 15 0	—		Nov. 1867
920	Stray Park, c, t, Camborne†‡	44 13 8	—		Jan. 1868
6000	Tamar Valley, s-l, Beeralston	0 7 6	¾		Feb. 1868
548	Trelyon Consols, t, St. Ives	16 0 0	—		Dec. 1866
6000	West Basset, c, Illogan†‡	1 15 0	—		Mar. 1867
1024	West Caradon, c, St. Cleer‡‡	20 10 0	7½		Mar. 1868
12800	West Drake Walls, c, Calstock	0 5 0	½	7s. 9s.	Feb. 1868
2582	West Great Work, t, Breage	5 11 0	—		June 1866
6000	West St. Ives, t, c, St. Ives	0 1 0	—	⅜ ½	Oct. 1865
512	West Wheal Frances, t, Illogan	106 15 0	35	37½ 42½	
5000	West Wheal Kitty, t, St. Agnes	2 19 6	—		Dec. 1867
6000	Wheal Agar, c, Illogan	7 11 0	—		Jan. 1867
512	Wheal Buller, c, Redruth†‡	24 0 0	14	10 12	Jan. 1868
849	Wheal Emily Henrietta, c, Illogan	20 0 0	24	23½ 24½	Jan. 1868
5724	Wheal Grenville, c, Camborne†	10 6 0	37s.	38s. 40s.	Mar. 1868
1040	Wheal Trelawny, s-l, Liskeard†	7 12 0	9	8 8½	Mar. 1868
5000	Wheal Uny, t, c, Redruth	10 14 6	1⅞	39s. 41s.	Oct. 1867

NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Bus. done.
2562	Abr'ham Cons., t, c, Crowan	1 7 0	—	
4000	Ballacorkish, I. of Man, l, c*	3 5 0	—	
4000	Bedford Consols, c, Tavistock	2 15 0	—	
4000	Bedford United, c, Tavist.*	2 6 8	—	
1031	Bedol Aur, l, Holywell	1 17 0	—	
1248	Boscaswell, t, c, St. Just	7 6 0	—	
2500	Bosworthen and Penzance	4 0 0	—	
5000	Bottle Hill, t, Plympton	1 14 6	—	
5000	Bryn Gwiog, l, Flint	0 18 0	—	
1200	Bryn Gwyn, l, Mold*‡	9 0 0	—	
1000	Budnick Consols	1 0 0	—	
5094	Bwlch Consols, s-l, Cardigan	4 0 0	—	
30000	Caldbeck Fells, l, Cumberld.*	1 15 0	—	
1000	Camborne Consols, c	18 10 0	—	
11000	Cape Cornwall, t, c* [8000 £2 10s. pd., 3000 25s. pd.]			
5000	Capel Banhaglog, l, Mont.	1 10 0	—	
1000	Cardynham China-clay*	3 0 0	—	
6000	Carn Camborne, c, Cambrn.	2 6 0	—	
4005	Cardigan Consols*	5 0 0	—	
600	Cardiganshire, l*	17 10 0	—	
20000	Carysfort [3200 £2¼ pd., 16800 £1½ pd.]			
2500	Central Minera, l, Wrexham*	3 17 6	—	
16000	Central Snailbeach l*	1 0 0	1½	1¼ 1½
3000	Chiverton Valley, l, Perranz.	2 0 0	4⅛	
2048	Colquite & Callington Un., c.	0 15 0	2¼	
256	Condurrow, c, t, Camborne‡	76 10 0	—	
50000	Connorree, c, sul, Wicklow*	1 0 0	—	
983	Copper Hill, c, Redruth‡	12 10 0	—	
12000	Crelake, c, Tavistock	3 12 0	—	
6000	Cuddra, t, St. Austell	5 5 0	—	
25000	Dundalk, Ireland, l*	0 15 0	—	
740	Eaglebrook, l, Talybont*	19 15 0	—	
1000	East Basset and Grylls, t	3 5 0		
6000	East Bottle Hill, t	0 11 0	—	
4000	East Chiverton, l, Perranz.	2 16 9	—	
4000	E. Gunnislake & S. Bed. c.	10 15 0	2½	1 1¼
6000	East Laxey, l, Isle of Man	2 15 0	—	
6000	East Neptune, c, Marazion	—	—	
5000	E. Rosewarne, c, t, Gwinear	2 17 0	⅜	
6000	East Snaefell, l, I. of Man*	2 10 0	1½	1¼ 1½
5610	East Seton, c, Camborne	0 13 6	—	
1190	E. Wh. Agar, c, St. Cleer	12 17 0	—	
5000	E. Wh. Rose Con., l, Per.*	2 5 0	—	
6000	Ebury Lead Min. Co., Flint*	1 15 0	1¾	
6000	Fortescue Cons., c, Tavistock	0 12 6	—	
940	Fowey Con., c, Tywardreath‡	5 4 6	—	
1026	Garden, c, Morvah	6 0 3	—	
6000	Gen. Min. Co. for Ireland, c.	5 10 0	—	
10000	Glan Alun, l, Mold	0 6 0	—	7s. 8s.
40000	Glasgow Caradon c* [30000 £1 pd., 10000 15. pd.]			
5700	Goginan, Cardigan, l	12 10 0	—	
6000	Gothic, s-l, Cardigan*	2 10 0	—	
486	Grambler & St. Aubyn, c†‡	73 0 0	4	
10000	Great Cwmsymlog, s-l*	1 15 0	—	
4096	Great Caradon, c, St. Ive	3 19 0	—	
3000	Gt. Chiverton, s-l, Perranz.*	3 10 0	—	
5000	Great Mona, l, Isle of Man*	4 0 0	—	
12500	Gt. No. Laxey (Isle of Man)*	0 15 0	—	
1000	Great N. Tolgus, c, Illogan	10 0 0	—	
15000	Great Rhosesmor, l	5 0 0	5⅜	
6000	Gt. S. Chiverton, s-l, Perranz	1 10 6	—	
3313	Gt. Wh. Baddern, t, Devoran	7 17 6	—	
119	Great Work, t, Germoe	100 0 0	—	
10240	Gunnislake (Clitters), t, c.	4 19 0	—	
6068	Gwydyr Park, l, Llanrwst	1 14 6	—	
6400	Harwood, l, Durham*	0 7 6	—	
1000	Hematite Iron Company*	5 0 0	—	
2500	Laxey Neath Smelting Co.*	3 10 0	—	
1019	Leeds and St. Aubyn, t, c	19 13 4	—	
151	Levant, c, t, St. Just	10 8 1	—	
2325	Lonsdale Iron Co. [650 £5 pd., 1675 £3 pd.]			
5120	Lovell Consols, Wendron, t.	0 4 0	—	
6000	Maudlin, c, Lostwithiel	4 7 0	—	
6000	Mid-Wales, s-l,*	2 4 0	—	
1000	Montgomeryshire, l, b*	2 0 0	—	
640	Mount Pleasant, l, Mold	4 0 0	—	
12800	Nether Hearth* [6400 £1 pd., 6400 2s. pd.]			
6000	New Birch Tor & Vitifer, t‡	1 13 6	—	
1500	New Chiverton, l, Perranz.	0 9 6	—	
6000	New Clifford, c, Gwennap*	2 15 0	2	
24000	New Cornish [12000 £1 pd., 12000 15s. pd.]			
6400	N. Crow Hill, l, St. Stephen	3 5 6	—	
6514	New E. Russell, c, Tavistock	0 12 6	—	
20000	New Gt. Cons., c, Tavistock*	0 17 6	—	
3000	New Huntingdon, t, Devon	0 1 0	—	
6400	New Pembroke, St. Blaz. t, c	1 9 0	—	
6000	New Prosper, t, c, St. Hilary	0 10 0	—	
3680	New Treleigh		—	
667	New Trevenen, t, Wendron	12 1 6	—	
4096	New Wh. Lovell, t, Wendron	1 14 0	—	
2000	N. Wh. Towan, c, t, Wendron	1 10 0	—	
16000	N. Devon, s-l, Combmartin	0 19 0	—	
5000	No. Dolcoath, c, Camborne	4 3 0	—	
1361	No. Grambler, c, Redruth	8 17 3	—	
6000	North Jane, t, s-l, Kenwyn	3 1 6	—	
2000	North Levant, t, c, St. Just	10 12 0	7½	
4000	No. Phœnix, c, Linkinhorne	4 11 0	—	
3933	North Pool, c, Illogan	5 16 0	—	
1024	No. Retallack, c, Perrazabuloe	2 0 0	—	
1935	No. Shepherds, l, Newlyn*	6 10 0	—	
6000	North Wheal Basset, c, t†	5 0 0	—	
6144	N.W. Robert, c, Smp. Spiney	4 8 11	—	
12288	Okel Tor, c, Calstock	2 7 4	—	½ ¾
8000	Old Gunnislake, c, Calstock	2 15 0	—	
6400	Par Consols, c, St. Blazey†‡	2 14 6	—	
5000	Pendeen Consols, c, St. Just	6 15 0	—	
4000	Penhale United, s-l, Perran.*	0 15 0	—	
2720	Penhale Wh. Vor, t, c, Breage	4 12 6	3¼	
5000	Penhalls, t, St. Agnes	3 0 0	—	
1772	Polberro, t, St. Agnes	15 0 0	—	
12000	Redmoor, c, t, Callington	1 15 6	—	
6000	Reinnie Laxey, l, I. of Man*	4 10 0	—	
3000	Rhydtalog, s-l, Cardigan	0 5 0	—	
6000	Roaring Water, c*	2 15 0	—	
2000	Rosecliff and Tolcarne, l*	9 10 0	—	
3973	Rosewarne Cons., c, Gwinear	7 2 6	—	
5915	Rosewall Hill & Ransom, c.	3 0 0	—	
10000	Royalton, t, St. Columb [5000 £1 1s. p., 5000 1s. p.]			
20500	Snaefell, l, Isle of Man*	1 0 0	—	
12000	Sortridge Cons., c, Tavistk.†	1 18 6	—	
512	South Basset, c, Gwennap	28 10 0	—	
3000	So. Chiverton, s, l, Perranz.	6 2 6	—	
6000	S. Dolcoath & Carnarth. Con.	2 16 6	—	
6000	So. Fowey, c, Tywardreath	0 10 0	—	
3395	So. Herodsfoot, l, Liskeard	4 4 0	—	⅜ ½
30210	South of Scotland, c*	1 0 0	—	
2739	South Trevenna, c, t	2 10 0	—	
937	So. Wh. Crofty, c, Illogan	24 10 10	—	
6000	South Wheal Grenville, t, c.	1 3 0	—	
400	So. Wh. Seton, c, Camborne	81 3 0	—	
236	Spearne Consols, t, St. Just	4 4 4	—	
242	Spearne Moor, t, St. Just	6 2 0	—	
673	St. Ives Wh. Allen, t, St. Ives	18 18 7	—	
8771	St. Just Amalg., t,* [6000 £3 10s. pd., 2771 £2 5s. pd.]			
300	Steeple Aston Iron Ore Co.	7 0 0	10¾	
7000	Stiperstones, l, Salop*	5 10 0	—	
3500	Tin Hill, t, St. Austell	1 12 0	—	
501	Tresavean and Trethurrup	16 11 0	—	
4440	Trevenen & Tremenheere	7 11 0	—	
4096	Trewetha, s-l, Menheniot	7 17 0	1¼	
1943	Treworlis, t, Wendron	11 15 4	—	
4200	Vigra and Clogau, c, Dolg.*‡	5 10 0	—	
1319	West Cwm Erfin, l* [319 £4 paid]		—	
256	West Damsel, c, Gwennap	38 10 0	—	
12000	W. Maria & Fortes., c, Lam.	3 11 6	—	
12800	West Prince of Wales, c	0 10 0	—	9s. 11s.
1000	West Rose Down, c, Linking.	20 17 6	—	
512	West Tolgus, c, Redruth	58 10 0	25	25 26
4096	W. Wh. Tremayne, c, St. Erth	0 6 0	—	
741	Wheal Basset and Grylls, t	7 18 6	—	
6000	Wheal Crebor, c, Tavistock	2 6 6	—	
4000	Wh. Emma, c, Buckfastleigh	3 19 0	—	
6000	Wheal Emily, s, Callington	0 1 0	2⅛	
6000	Wheal Ida, s-l, St. Ive	1 5 6	—	
1024	Wh. Kitty, t, Uny Lelant†	3 10 6	7	
896	Wh. Margaret, t, Uny Le.‡	13 17 6	—	5 6
728	Wheal Margery, St. Ives, t, c	26 14 0	—	
6000	Wheal Mary Florence, c*	2 4 0	2	
1000	Wh. Mary Hutchins, c, Plymp.	2 0 6	—	
6000	Wheal Sparnon, c, Redruth	3 12 0	—	
1920	Wh. Trannack, c, Sithney	1 13 3	—	
1200	Wheal Trevenna, t, c*	10 0 0	—	

MISCELLANEOUS.

Shares.	Mines.	Paid.	Last Pr.	Bus. done.
60000	Anglo-American Telegrh.*†	10 0 0	22¼	
10000	Arklow Chemical Works, l	1 0 0	1⅛	
30000	Central American Associ.*†	1 10 0	—	1¼ 1⅜
80000	Ebbw Vale Iron Co.*†	27 0 0	—	
148525	London Gen. Omnibus*†	4 0 0	2	1⅞ 2

b, blende; *cl*, coal; *c*, copper; *g*, gold; *l*, lead; *s*, silver; *sl.*, slate; *s-l*, silver-lead; *t*, tin; *z*, zinc.

. Companies marked thus * have been incorporated with Limited Liability; those marked † have been admitted on the Stock Exchange, those marked thus ‡ have paid Dividends.

London: Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—*April* 18, 1868.